METAL PRODUCTS MANUFACTURING

# MPM

Serving the Appliance and Electrical Metal Products Industry

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MAY 1960



PMI Looks at the Space Age — Page 29



Special Kelvinator Section — Page 47



Questions and Answers on Metal Curtain Wall Construction — Page 32

# The Clearing Torc-Pac Press—

## "MAINTENANCE-FREE OPERATION"


SINTERED BRONZE CLUTCH AND BRAKE LININGS ARE "OIL PLATED" AGAINST WEAR.

### ITS TORC-PAC DRIVE IS SEALED-IN-OIL AND GUARANTEED FOR 18 MONTHS

Press clutch and brake maintenance is expensive and resulting downtime is a costly aggravation to production men. In the Clearing Torc-Pac O.B.I., maintenance of these critical components is eliminated completely. We're so sure of the perfect operation of the Torc-Pac press that we have sealed the drive to prevent unnecessary tampering. The drive is guaranteed for eighteen months provided that the seal is unbroken.

Torc-Pac is the press built with the new "building block" concept in mind. Therefore, a single spare drive unit can serve as a replacement for a shop full of Torc-Pacs. Find out about the only really new O.B.I. in 25 years—the Clearing Torc-Pac.

**USI Clearing**
Division of U.S. Industries, Inc.
6499 West 65th St. • Chicago 38, Ill.

*Write for fact filled catalog*

Look for the CLEARING NAME on these products

Mechanical Presses • Hydraulic Presses • Torc-Pac O.B.I. Presses • Axelson Lathes • Harrison Lathes • Special Equipment for Aircraft and Missiles Mfg. • Dies • Torc-Pac Drives • Research and Development

# Here's a special Armco metal that's made for porcelain enameling

New steels are born at Armco

## That's why Armco Enameling Iron is "standard" for high quality finishes

Porcelain Enameled Steel

1. **Resists sag**—Armco Enameling Iron stubbornly holds its shape at *all* porcelain enamel firing temperatures. Critical dimensions stay accurate.
2. **Commercially pure**—This special enameling base contains a strict minimum of carbon and gas-forming inclusions. Finish defects stay low.
3. **Surface grips enamel**—The slightly-roughened surface of Armco Enameling Iron promotes even flow of slip and a tight porcelain-metal bond develops during firing.

**Few rejects—more sales**

Perfect fit and flawless finish are easier to achieve when parts are made from Armco Enameling Iron. This holds down costly rejects. It also means more sales appeal for clothes washers, dishwashers, ranges, refrigerators, and other products that receive critical customer inspection.

For complete information on Armco Enameling Iron, just write Armco Steel Corporation, 1140 Curtis Street, Middletown, Ohio.

**ARMCO STEEL**

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation

*are you sure you have the Right Frit for*

# Your particular enameling problem

● Conditions vary in every enameling plant. End result requirements vary—special application problems arise. That's why, here at Ing-Rich, we do not want to recommend any Frit to a customer until we have studied his particular enameling problem, his conditions; his requirements.

## *Case histories prove our point*

We can show you case after case where a change in Frit coming as a result of our study of enameling conditions, special application problems, handling, etc., has given the customer better enameling results, less rejects, lower production costs.

## *Ing-Rich practical "Know How" can prove valuable*

Because our ceramic engineers are working, day in and day out, with the practical technicians in our own large enameling plant, where we enamel a very wide range of products and constantly face special application problems, we can bring you a scientific and practical "Know How" which will enable us to come up with the *RIGHT* Frit for your particular enameling operation.

*Pioneer Producer of*
LIFETIME
*Porcelain Enamel Products*

**INGRAM-RICHARDSON, INC.**

OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA

ING-RICH
FRIT
*The Plant Tested Frit*

MAY • 1960
VOL. 17 • NO. 5

# MPM

(including finish)

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## FEATURES



## SHORT FEATURES



## DEPARTMENTS



## METAL PRODUCTS MANUFACTURING

*FROM RAW METAL TO FINISHED PRODUCT*

**A trade publication** devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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# Testing, t
# and techn

*. . . the "plus value" of DeVilbiss total service makes the difference between ordinary and outstanding finishing or coating operations*

**The extra services** DeVilbiss offers make the difference between a merely good finish and a superior finish on your product . . . between a hodgepodge of equipment and a practical, smooth-working setup . . . between an adequate finishing method and the scientifically correct method . . . between average operators and trained craftsmen.

## Laboratory research is one.

We can run comparison tests on your product or component using your coating formulation with all the latest equipment, both automatic and manual. You receive a complete report—including the actual production rates, material consumption, labor savings, and coating properties, plus the proper combination of equip-

# training, nical help

ment for each method tested. It's scientific. It's accurate. There's no obligation.

## Operator training is another.

The DeVilbiss tuition-free spray-painting school in Toledo offers intensive one-week courses to make your operators or supervisors more skilled in the use of the precision coating and finishing equipment you invest in. It includes application instruction, equipment maintenance, as well as procedures for adapting existing equipment to new requirements. On request, training courses can often be arranged in your plant.

## And field services.

DeVilbiss branch office engineers are especially trained to aid you in planning, selecting, and installing washing, coating, and drying equipment. In addition, DeVilbiss factory branches keep a full line of spray equipment and accessories, hose, paint pumps, and air compressors in stock for "off-the-shelf" buying convenience. Rebuilt Exchange on guns and compressors, and authorized factory service on all equipment items are maintained from coast to coast. More than 150 strategically located distributors and jobbers also stock and sell DeVilbiss parts and equipment.

**This is total service** from DeVilbiss. Put it to work for you and see the rewarding difference in *your* coating or finishing operations. The DeVilbiss Company, Toledo 1, Ohio. Also Barrie, Ontario; London, England; São Paulo, Brazil. Branch offices in principal cities.

FOR TOTAL SERVICE, CALL
DEVILBISS

# From hair pins to rockets


***Look into production savings possible with automatic***

# DESPATCH FINISHING SYSTEMS

Control panel along wall controls material flow through washing, rinsing, chromic acid treatment, finish coating on metal and finish baking.

Electro-static spray booth in finishing department of refrigerator manufacturer. Completely automatic control.

Small 3 stage washer and dry-off oven prepares small parts with maximum automation.

Finish Bake Oven in modern tractor plant shows programing of all components to expedite assembly at exit of Despatch baking oven.

When competition forces your prices down and you are casting around for a way to save your customers without losing your profit . . . look into your finishing department. For 20 years new synthetics have been altering requirements in finishing equipment. In more recent times new material handling methods have introduced new ways to organize finishing production to lower handling costs.

Through this finish production revolution, Despatch Engineers have maintained close contact with leading chemical research and development organizations. Our engineers have collaborated with basic metal manufacturers and finish coatings producers to develop processes in wide use today. Many of these developments are protected by Despatch patents.

*Our 50 years in building heat processing equipment for American industry provide a dependable background for the latest scientific applications of automation in finishing systems. You will find our experience helpful in solving your problems of material handling, washing, chromic acid treatment, finish coatings, drying and baking of any product.*

*You will find our engineers resourceful in applying their information to improving your finishes and cutting your production costs.*

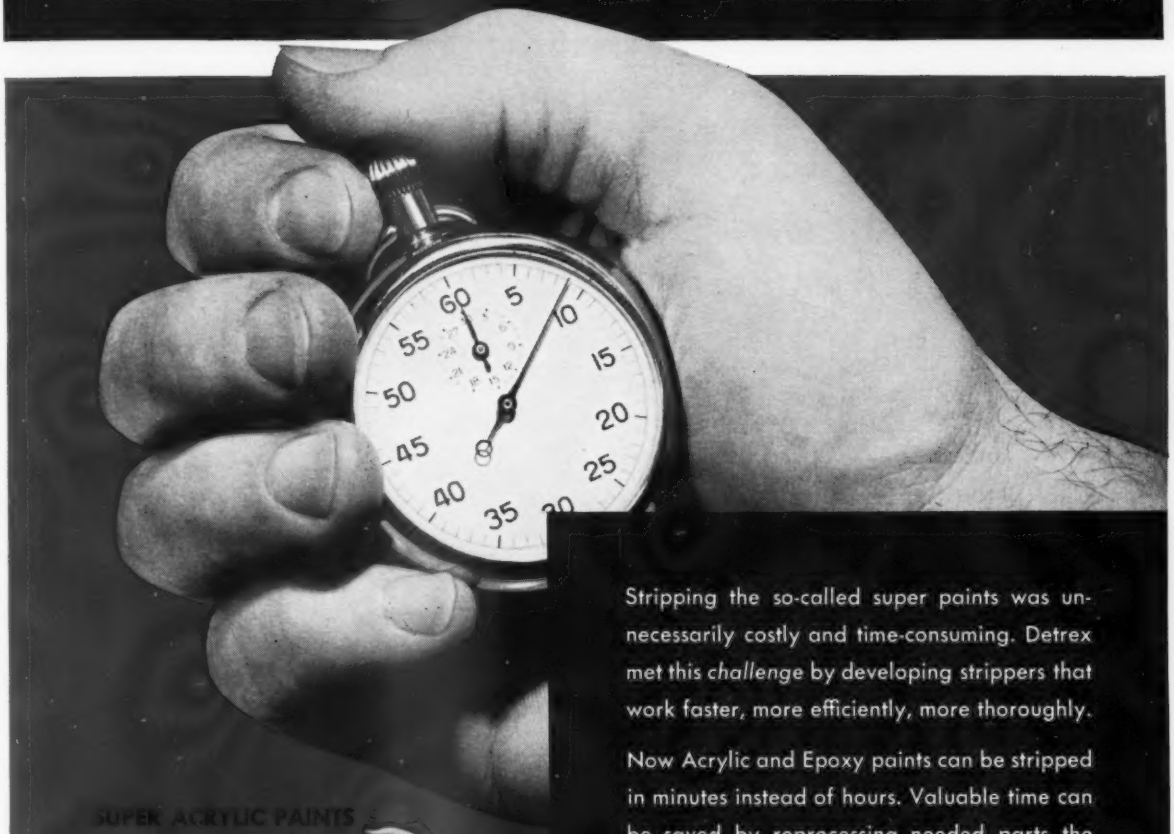
***Write today*** for a resident engineer or request bulletin No. 51

DESPATCH OVEN CO.

## DESPATCH OVEN COMPANY

619 S. E. 8th Street • Minneapolis, Minn.

# Now You Can Time Paint Stripping With a Stopwatch



Stripping the so-called super paints was unnecessarily costly and time-consuming. Detrex met this *challenge* by developing strippers that work faster, more efficiently, more thoroughly.

Now Acrylic and Epoxy paints can be stripped in minutes instead of hours. Valuable time can be saved by reprocessing needed parts the same day.

Regardless of your paint stripping method — Detrex can assist you in speeding your operation and reducing over-all costs. Why not talk to a trained Detrex field representative now? They welcome the real "toughies".

SUPER ACRYLIC PAINTS
Fast!

MODIFIED ACRYLIC PAINTS
Fast!

SUPER EPOXY PAINTS
Fast!

**DETREX** CHEMICAL INDUSTRIES, INC.

MAC CHEM

# 1-2 CLEANING PROCESS for ENAMELING

## for High Quality PORCELAIN ENAMELING

**IT'S A HIGH SPEED CLEANING PROCESS THAT CLEANS SO IT STAYS CLEAN**

In enameling, there's nothing so costly and disheartening as rejects. If you are faced with this difficulty—due to unclean metal parts—Mac Chem 1-2 Enameling-Cleaning Process can be of an infinite help.

While we do not claim that Macco Cleaner and Cleaning Process will entirely eliminate all rejects, we do maintain they will reduce them to minimum.

**1** **Mac Clean No. 20 is a Heavy Duty Cleaner specifically designed to remove all special enameling drawing compounds, etc. It is a fast, easy-to-use, economical cleaner — non-toxic, non-corrosive, and non-injurious to metals.**

**2** **Mac Chem No. 30 is a Second Step, Light Duty Cleaner which removes all residue from the cleaner baths, leaving the metal so chemically clean that it stays clean and readily accepts acid pickle and nickel.**

**FOR QUICK RESULTS**

*Write or phone Macco today and have a Macco engineer make a demonstration in your plant. No obligation, of course.*

This 2-Stage Metal Cleaning System is serving some of the country's largest porcelain enameling plants. Can be used with equal effectiveness in both automatic and batch type equipment.

MACCO PRODUCTS COMPANY

***Manufacturers of Better Metal-Working Compounds since 1931***

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS • PRESCOTT 9-0800

# BETHNAMEL

*a brand **NEW** kind of **STEEL SHEET***
*for porcelain enameling*

BETHLEHEM STEEL

# NEW BETHNAMEL

BETHLEHEM STEEL

*...superb results at low costs*

*...for either two-coat or direct-on porcelain enameling*

Here is a totally new kind of steel sheet which provides a really outstanding enameling job, not only in the standard two-coat process but for single, "direct-on" cover coating too.

Developed by Bethlehem research engineers, Bethnamel is produced by an entirely new method. This new sheet has the amazingly low carbon content of about .003 pct, barely 1/10th that of ordinary enameling iron. Other elements are properly balanced to maintain superb enameling properties, and provide good sag resistance, drawability, and weldability, as well.

## Single-Coat with Minor Changes in Cycle

With Bethnamel, boiling and fish-scaling are no problem, making this remarkable new sheet far superior to other enameling materials in the direct-on cover coat process. Simple, inexpensive modifications of existing two-coat pre-treatments are all that are needed to assure excellent adherence and rich appearance of the enamel.

## Direct-on Method Cuts Costs

Bethnamel costs no more than conventional enameling iron. Thus enamelers can save on processing without adding to base metal costs. Bethlehem engineers are anxious to help you get started with this superior enameling sheet. If you're interested, by all means let our nearest sales office give you full details.

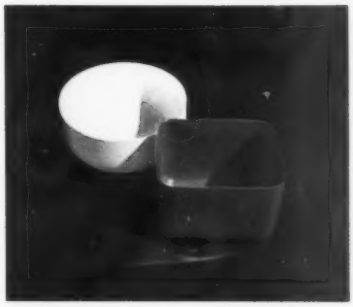
RANGE TOPS DEEP-DRAWN at Caloric Appliance Corp., Topton, Pa., are unusually tough draws, because of the relatively sharp corners. Bethnamel sheets take this severe drawing beautifully, prior to enameling.

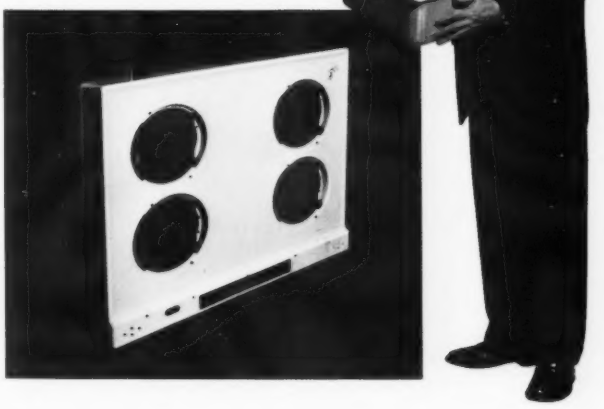
GAY PORCELAIN-ENAMELED PANELS on this school speak for the rapid growth of colorful curtain wall construction. Bethnamel sheets have proved ideal for these applications, due to high sag resistance and excellent enameling properties.

BETHLEHEM ENGINEERS WIL

**BETHNAMEL EASY TO DEEP-DRAW**

Drawing-quality Bethnamel sheets can be deep-drawn with superior results, as shown in this group of tough-to-make porcelain-enameled articles. No splits or cracks here!





**SUPERIOR SAG RESISTANCE**

These 20-ga samples of Bethnamel (A), enameling iron (B), and cold-rolled steel (C), demonstrate that Bethnamel's sag resistance is better than that of enameling iron, and far superior to cold-rolled sheet steel, at firing temperatures of 1600 degrees.

**ENAMEL THAT REALLY STAYS ON**

In this torsion test, a simple angle of direct-coated Bethnamel was twisted 180 degrees without damage to the enamel. Because its thickness is only 3 to 4 mils, compared to 6 to 8 mils or more for 2 coats, a direct-on enamel can withstand much rougher handling!

**TYPICAL MECHANICAL PROPERTIES**

20-Gage Bethnamel Sheet

| | Yield Strength (psi) | Tensile Strength (psi) | Total Elongation | Rockwell B | Olsen Cup Test (inches) |
|---|---|---|---|---|---|
| Longitudinal | 26,000 | 43,000 | 38 pct | 43 | 0.425 |
| Transverse | 28,000 | 44,000 | 40 pct | | |

ELP YOU WITH YOUR STEELWORKING PROBLEMS

BETHLEHEM STEEL

# NEW BETHNAMEL
## lights up like a lamp!

Now sheet-steel-and-ceramic panels can light up a room without bulbs, tubes, filaments, or cathodes! Called Panelescent® Lighting, this revolutionary "area" source of light is a development of Sylvania Lighting Products. A whole ceiling can become one huge lamp, or specific portions of an area can be lighted up, as in the automobile instrument panels shown here.

New Bethnamel sheet steel is proving to be a very practical base metal for Panelescent® applications. Sylvania is just one of many companies which are growing increasingly enthusiastic about Bethnamel. The future looks bright, both for Bethnamel and the porcelain enameling industry!

*"Panelescent®" is Sylvania's registered trade name for electroluminescence*

# Steel
## *is strong, ductile, versatile...* AND BETHLEHEM MAKES IT IN NEARLY EVERY FORM

**Here's a partial list of steels and specialty products in the Bethlehem line:**

**BARS AND BILLETS:**
Carbon and alloy AISI grades
Concrete reinforcing bars
Leaded steels
Special rolled sections

**TOOL STEELS:**
Water, oil, and air-hardening grades

**ROD AND WIRE:**
General and special-purpose types
Fine and shaped wire

**FORGINGS:**
Drop, press, hammer, and upsetter
Rolled-and-forged sections

**SHEETS:**
Hot- and cold-rolled
Continuously galvanized
Enameling sheets

**TIN MILL PRODUCTS:**
Electrolytic and hot-dip tinplate; blackplate

**PLATES:**
Universal and sheared
Flanged and dished heads

**FASTENERS:**
Bolts, cap screws, rivets
Special fasteners

**STEEL PIPE:**
Continuous butt-weld
Electric resistance-weld

**STRUCTURAL SHAPES**

**COLD-FORMED SHAPES**

**PALLET RACKS**

**WELDMENTS:**
Frames, tanks, housings, vessels

**FREIGHT CARS, PARTS, WHEELS, AXLES**

**WIRE ROPE AND SLINGS**

**RAILS:**
Tee, crane, girder

**CASTINGS:**
Carbon, alloy, and stainless steel
Iron, brass, bronze

**Room 1041,**
**Bethlehem Steel Company, Bethlehem, Pa.** M10
*Please send me literature describing these products:*

_____

_____

Name_____

Company_____

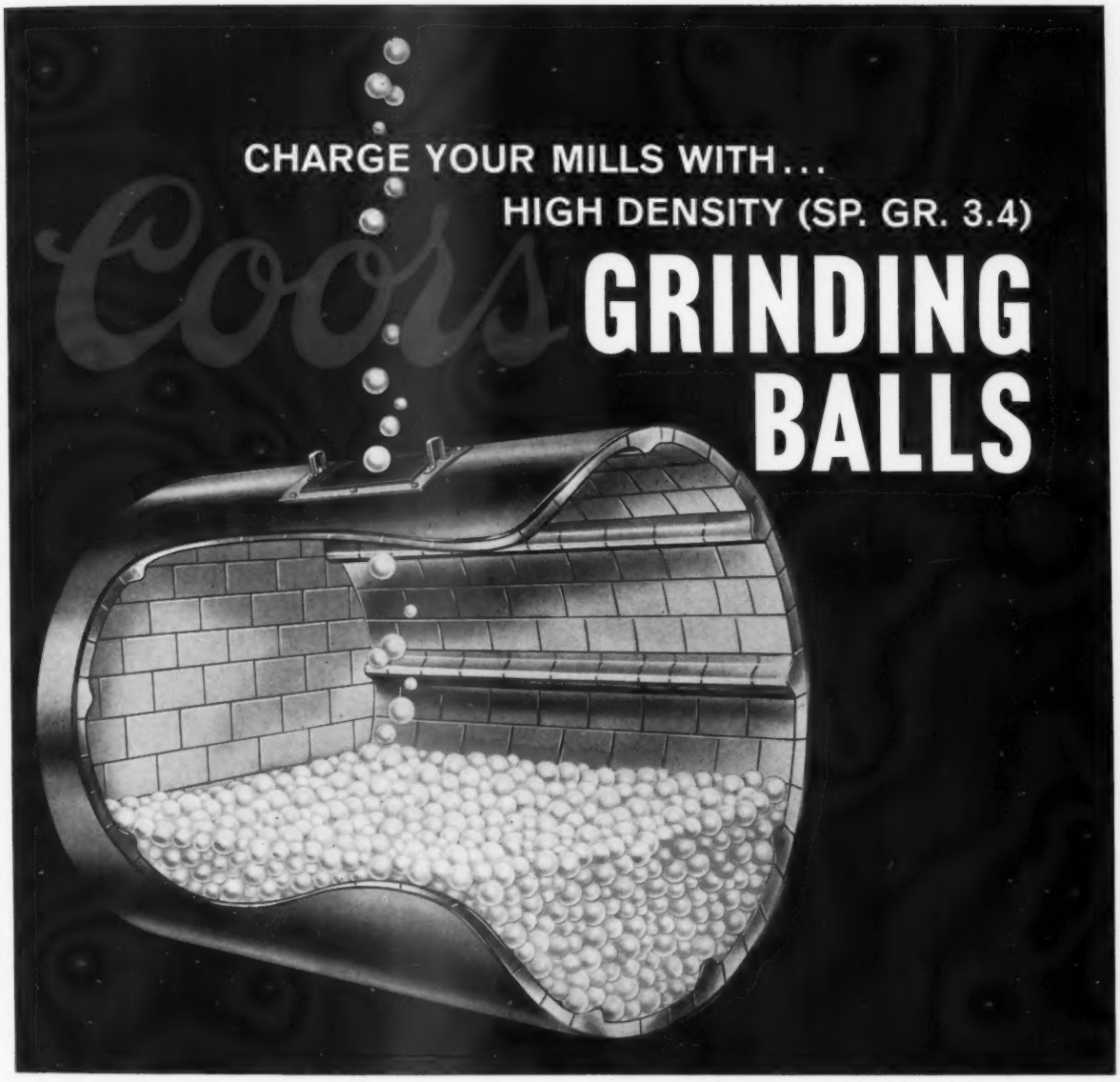
Address_____

City_____ Zone_____ State_____

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
*Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

**BETHLEHEM STEEL**




# *Save Time! Save Money!*

**REDUCE** your grinding time 40 percent or more! Increased grinding efficiency results from the greater weight (Sp. Gr. 3.4) of Coors High Density Grinding Media.

**INCREASE** production of existing mills by taking advantage of the reduced grinding time—or you can increase the batch and get more volume from your mills on your present grinding schedule.

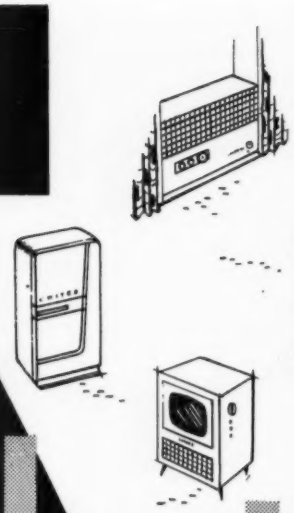
**IMPROVE** milling results—by operating your mills at lower temperatures, by eliminating excessive amounts of unground material, by making it easier to clean the media and by getting longer wear from the media and the mill lining.

We shall be glad to give you our recommendations on how to achieve these results if you will write to us on your company letterhead and describe your operating problem.

## COORS PORCELAIN COMPANY

**600 NINTH STREET—GOLDEN, COLORADO**

*Manufacturers of High Density Grinding Media and Mill Liner Brick.*



here's how positive product

# identification

RCA Victor
Zenith
American St. Louis Furnace
Sylvania
Westinghouse
Mansfield

can help your sales

Immediate spontaneous recognition of your product on the showroom floor . . . this is what your entire promotion plan is geared to produce. And this is what you can expect with La France die cast name plates and decorative trim.

Three-dimensional cut-out letters with lustrous metal plated finishes are certainly attention getting . . . and your own trade mark or trade name design can be accurately reproduced by the La France craftsman. Choice of finishes and fasteners. La France specialized design and engineering facilities available at no charge. Worth looking into!

**free**

write for sample name plate and technical bulletin.

29th & McKEAN STS. PHILADELPHIA 45, PA. HOward 5-7106

La France® PRECISION CASTING CO.

. . . for the name in front!

## MPM

## editor's mail

### Article evokes much interest

Gentlemen: Thank you for sending us the reprint of the article which appeared in the November, 1959 issue of METAL PRODUCTS MANUFACTURING, Volume 16, No. 11, entitled "Coating coil steel in 48 inch width."

The article has created so much interest here that we would like three to six more reprints. It would be appreciated if you would send us these extra prints, and bill us if there is any charge.

**W. E. Haldeman, Technical Sales Service**
**Socony Paint Products Co.**
**Metuchen, N. J.**

### Obsolescence

Gentlemen: I always look forward to receiving the new issue of METAL PRODUCTS MANUFACTURING . . . The subject of "Progressive Obsolescence," "Planned Obsolescence," give it any title you want; it is certainly getting a lot of attention, and I think you have a constructive bit to say in this latest editorial.

**Juel M. Ranum, Assistant to the Chairman of the Board**
**Whirlpool Corp.**
**St. Joseph, Mich.**

Reference is to the Finish Line editorial, "Building for obsolescence," Page 12, March, 1960 MPM.

The Editors

### Foamed-in-place insulation

Gentlemen: Your March, 1960 issue carries an article about foamed-in-place insulation in the new Whirlpool gas refrigerator. It simply mentions urethane type of insulation, in thicknesses of 2¾ inches.

We would like to learn more about this particular type of foam, since we are using polyester-resin foamed in place in an irregular shape, and are experiencing considerable difficulty in shrinkage. It might be that their material would give us better performance.

**Carl R. Stoelting, Chief Engineer**
**Stoelting Brothers Co.**
**Dairy Equipment Div.**
**Kiel, Wis.**

See the article, "Insulating refrigerators with urethane foam," Page 39, April, 1960 MPM dealing with this subject.

The Editors

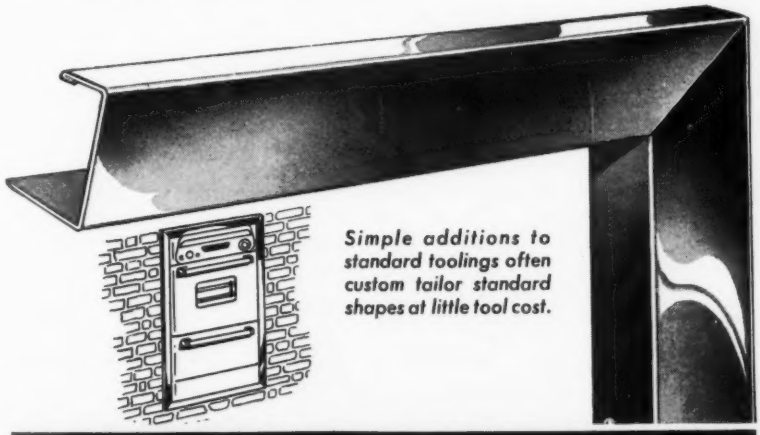
### A long time reader

Gentlemen: Your kind letter reminds me of the long ago years when Mr. Dana

*to Page 23* →


THE STYLE LINE OF FINE KITCHEN DESIGN


From frames for built-ins . . . to sparkling accents for free-standing appliances . . . yes, even to the proverbial kitchen sink—the style line of today's modern kitchen is Stainless Steel Trim . . . by Pyramid. Your product can tie in with this motif of fine kitchen design—efficiently, economically with any one of hundreds of standard or special shapes, tailored to fit your exact needs. Write today for complete details.



*Simple additions to standard toolings often custom tailor standard shapes at little tool cost.*

**Pyramid Mouldings Inc.**

5365 WEST ARMSTRONG AVE., CHICAGO 46, ILL.—BRONXVILLE, NEW YORK
WESTERN MOULDINGS INC., 1111 EAST 8TH STREET, UPLAND, CALIFORNIA

# Before You Buy Any DIRECT WHITE FRIT Answer These 4 Key Questions

**Q. RESEARCH.** *Who pioneered in one-coat direct-on research?*

**A. HOMMEL.** The O. Hommel Company began its pioneering research in the white direct-on steel field more than 35 years ago.

**Q. EXPERIENCE.** *Who has had the most experience in producing commercially white cover coat frits for direct-on applications?*

**A. HOMMEL.** As early as 1947, this program produced white frits for commercial one-coat use.

**Q. COVERAGE.** *Who leads in one-coat commercial coverage?*

**A. HOMMEL.** Commercial coverage of Hommel one-coat white frits from 1947 through 1959 is over 100 million square feet.

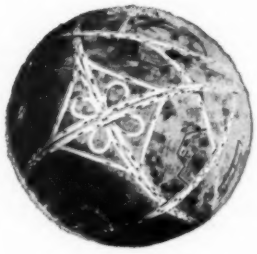
**Q. VERSATILITY.** *Who has a frit commercially usable on all steels suitable for one-coat porcelain enameling?*

**A. HOMMEL.** You're not limited to one steel supplier or one metal preparation system. Hommel one-coat frits can be satisfactorily used with all direct white processes on all steels suitable for commercial direct-on application.

These are the important facts. Hommel leads the industry in research and production of white one-coat frits. Hommel continues to be your best source of supply for all your porcelain enameling requirements—groundcoat, covercoat, one-coat, XLT frits, and coloring oxides.

To learn how Hommel puts more profit in your porcelain enameling picture, see your local Hommel representative. Or contact us direct.

COVERAGE FROM THE ATLANTIC TO THE PACIFIC



*Commercial use of Hommel one-coat frits from 1947 through 1959 would completely cover a trans-continental highway more than seven feet wide.*

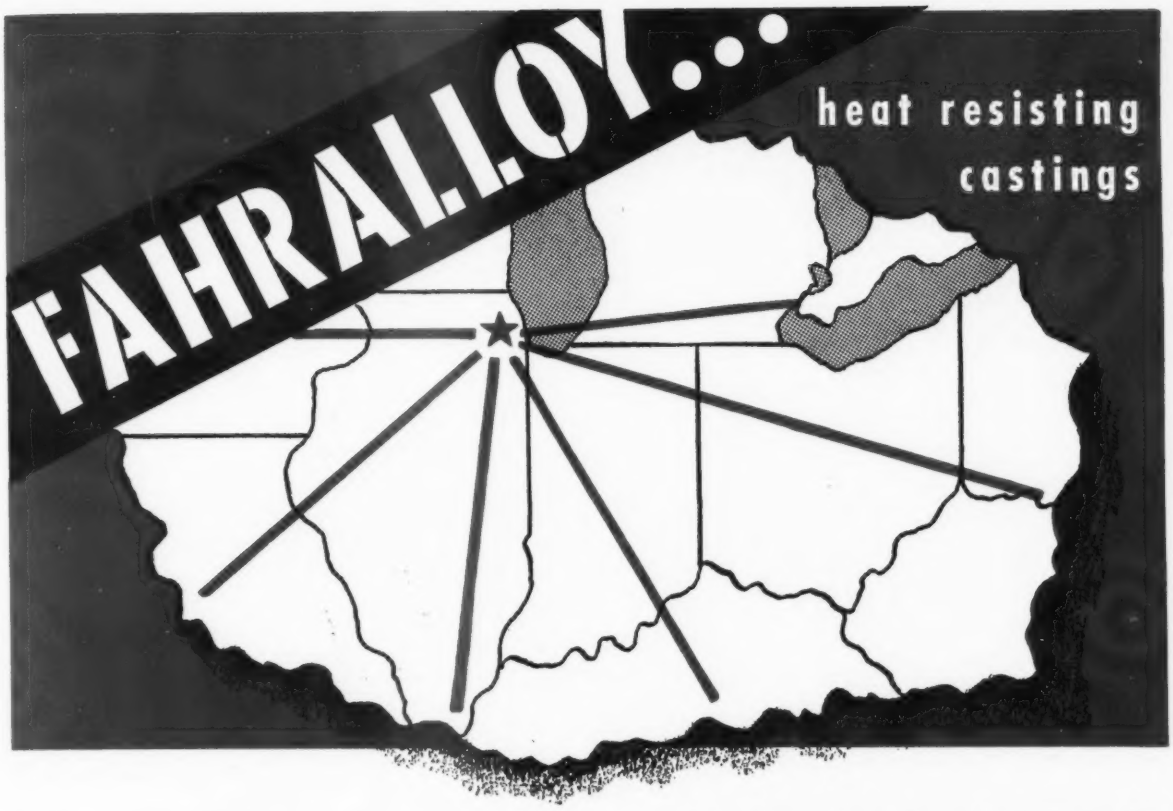
**THE O. HOMMEL CO.**

PITTSBURGH 30, PA.

West Coast — 4747 E. 49th Street, Los Angeles, California

DEPT. MPM-560

HOMMEL




# NO. 1 SOURCE OF SUPPLY FOR BURNING TOOLS

Here at Fahralloy we believe in giving service as well as manufacturing top quality heat and corrosion resisting castings. In fact, service is a keystone upon which our business has grown over almost a quarter of a century. Sitting here at the hub of industry in the heart of America we're never more than a few hours away from you at most. No matter what your problem may be if a heat and corrosion resisting casting is involved, you'll find the solution at Fahralloy. Try us and see for yourself.

**RACKS • FIXTURES • BARS • POINTS**
**TREES • COAT HANGERS • HOOKS**

**Fahralloy serves the nation and the nation's leading industries with heat and corrosion resisting castings.**

- AIRCRAFT
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- AUTOMOTIVE
- CHEMICAL
- DRUG
- FARM EQUIPMENT
- FOOD PROCESSING EQUIPMENT
- GENERAL MANUFACTURING
- PUMP MANUFACTURERS
- STEEL

## the fahralloy co.

A Member of the Alloy Casting Institute

150TH AND LEXINGTON AVENUE • HARVEY, ILLINOIS

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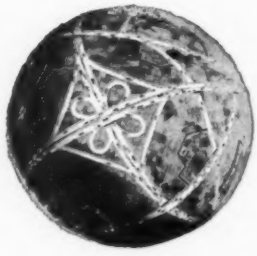

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**THE O. HOMMEL CO.**

PITTSBURGH 30, PA.

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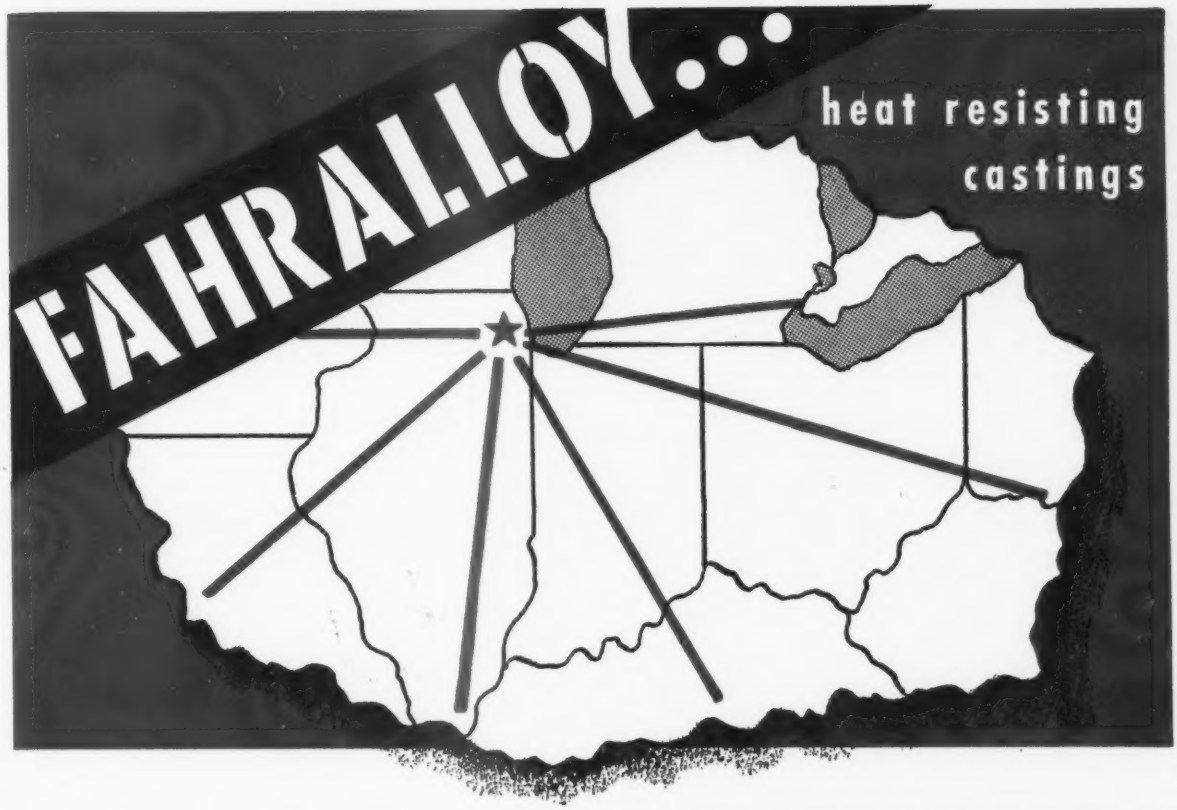


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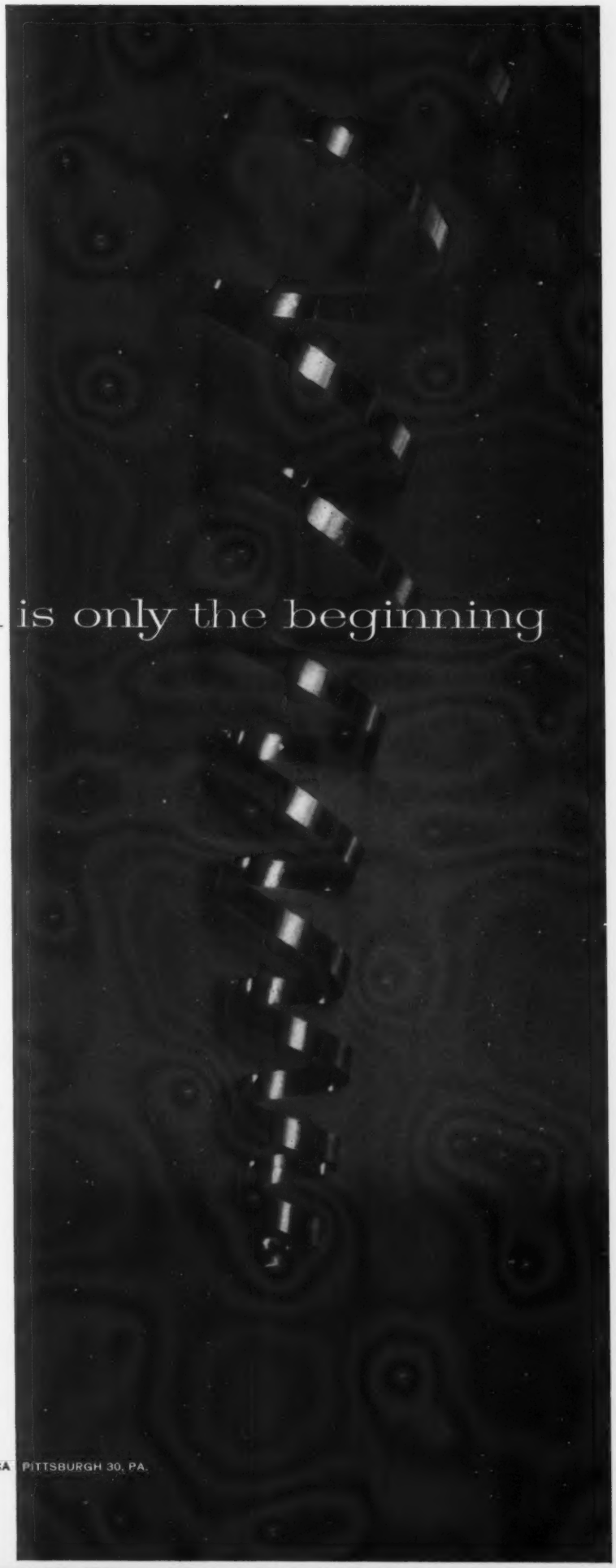
*from creative Crucible*

# Where a fine finish is only the beginning



The lustrous beauty and unsurpassed finish of Crucible stainless steel will enhance the sales appeal of any product. Crucible's experienced metallurgists can help you select the most suitable type, form and finish, and the most efficient technique for fabricating. Add to this the convenience of Crucible's nearby steel service centers (34 throughout the country) and you'll find Crucible an unbeatable combination — for superior steel . . . service . . . and supply.

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# THE FINISH LINE

HERE IN SUNNY FLORIDA, we find an ever increasing market for appliances. Each year that we visit the Sunshine State, new sections of sand and waste land have been transformed into golf courses, gardens, and palm and flower-covered areas.

It seems that the requirement for hotels, motels and homes must have been met, but each year we see literally hundreds of new motels and hotels and thousands of new homes of typical Florida style.

It becomes quite evident that this never ending building program represents a vast market for all types of appliances. The volume here is not in the super-deluxe class but in the "builder," space saving, "efficiency" products.

### Heat pumps and air-conditioning

Climatic conditions in Florida offer a great opportunity to the manufacturers of air-conditioning equipment — and believe it or not, heating equipment (for minimum requirements) also. Here, the heat pump has its best opportunity to prove its worth.

The opportunity, however, is not without its responsibilities and its hazards. Salt air can prove disastrous to *any* exposed metal product. Then, too, equipment designed to provide cooling-heating at temperatures above 40° F. just *may* be required to operate at temperatures below this temperature.

### A case history

A case history of a typical small holiday spot should be of interest to MPM manufacturer readers.

At a Pompano Beach address, there are eighteen room-type air conditioning units, of which ten are the reverse-cycle type for cooling-heating.

Compressors are guaranteed for five years, fan motors for one year.

Nine one-ton reverse-cycle units were put in service in January, 1957. Eight one-ton units for cooling only, and one three-quarter-ton reverse-cycle unit, were placed in service in 1958.

The first group was builder-contractor installed, and the latter group was local carpenter installed.

All were purchased from a large distributor dealer, representing one of the nation's most important manufacturers.

### Owner comments

The units that were builder-contractor installed were set in building openings without gaskets or caulking. Result: water and air leaked into living areas until the improper installation was rectified.

Units installed later had close fit and careful caulking — no water leaks.

Of the reverse-cycle models in use, four have to date required replacement of units — (within the five year warranty period). However, the replacement requirement for fan motors averages one per year for each window unit in use.

The later models installed in 1958 have required no replacements of compressors or fan motors.

Grille work is of non-corrosive material, but drip pans, outside enclosures, and interior components are of steel, improperly coated to resist salt air conditions.

Three dials are used for the control system, and the instruction panel is ambiguous to the average user.

### User experience

Through coincidence, the reverse-cycle unit in our apartment was out of order when we moved in.

A polite serviceman arrived and, after an inspection (inspection showed the complete interior to be uniformly coated with rust), advised the owner that the "unit" and "valve" required replacement.

"How soon?"

"Parts must come from the factory — we never keep them in stock."

The complete unit was replaced and operates very well, but we must confirm the statement that the operating instructions appearing on the cabinet interior are not sufficient for this user. One dial, for example, must be turned clockwise for cooling and counter-clockwise for heating. Unfortunately, when turned for cooling, it reads "warmer" and vice-versa.

### Food for thought

It's just possible that this abbreviated case history, which undoubtedly could be repeated hundreds of times in this territory, might give appliance engineers interested in heat pumps and air conditioners some food for thought.

Why not give consideration to the use of materials with greater resistance to salt air corrosion — at least for the sea coast markets.

Check on the possibility for simplified control systems *and* instructions that can be followed by any transient user.

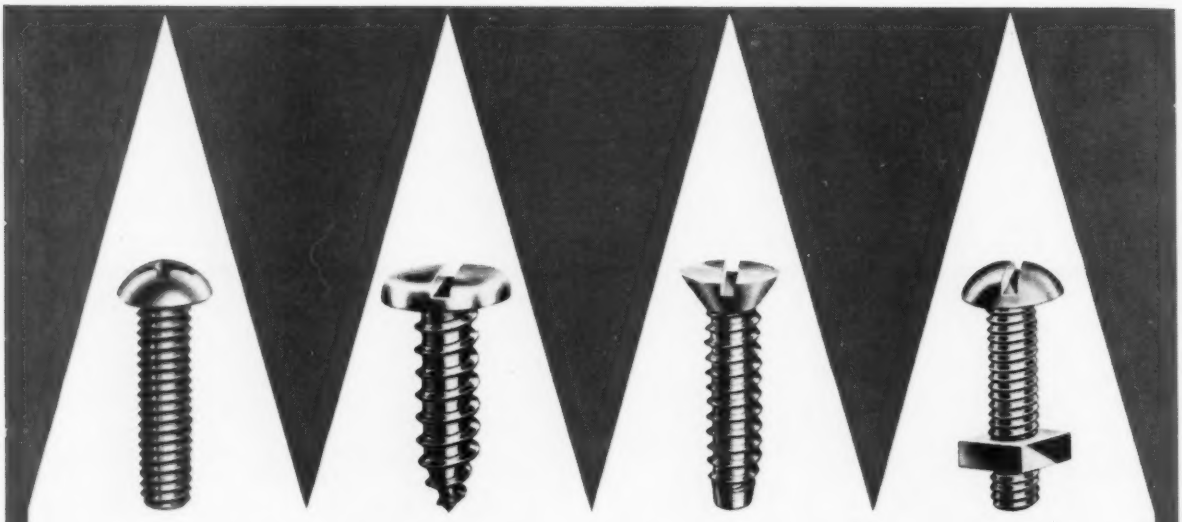
Encourage the stocking of major components at points within a reasonable distance of users in sections so important to the product involved.

Question the advisability of selling reverse-cycle units that do not have provision for auxiliary heating units to take over when the weatherman turns on the "cold" in sections where balmy weather is normally expected.

The thousands of units in use in Florida can be the forerunners of many, many thousands more, if manufacturing progress and service to the user can keep ahead of field requirements.

Dana Chase

EDITOR AND PUBLISHER



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It will pay you to try Southern on your next order. Write today, using your letterhead, for our Stock List showing current variety of fasteners ready for delivery in large or small quantities. Address Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

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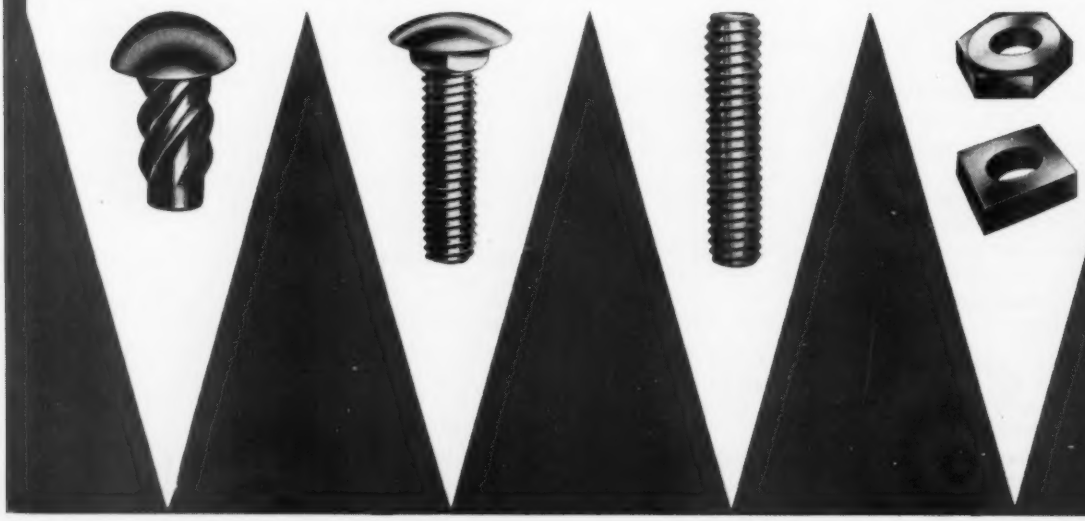


## Editor's mail

→ *from Page 15*

Chase started his new magazine, METAL PRODUCTS MANUFACTURING (then *Finish.*)

I was very active in the Utility industry and had copies from the first issue.

I appreciate the kindness of Mr. Dana Chase and others of the editorial staff of the publication, who have been so kind as to send the magazine to me for these many years.

I want to extend to all, who now are building each month a magazine of great importance and dignity, my best wishes.

Since the discontinuation of the *Woman's Home Companion,* I find I do not have the need of my copy of METAL PRODUCTS MANUFACTURING as I did when actively employed. So, as much as I will miss not seeing it in my mail box each month for sixteen years, and looking for the new products and people, I hope you will put my copy to good use with another true friend of your excellent publication.

**Mrs. F. Porter Gore**
**20 East 35th St.**
**New York, N. Y.**

Mrs. F. Porter Gore, formerly Ada Bessie Swann of the editorial staff of *Woman's Home Companion,* has been deleted from the MPM mailing list. We hate to lose a long time reader such as Mrs. Gore. We do, however, appreciate her very kind and thoughtful comments.

The Editors

### Die help wanted

Gentlemen: The writer has a hazy recollection that one of the issues of your magazine, METAL PRODUCTS MANUFACTURING, during the past year, contained an article regarding the use of inexpensive temporary dies for blanking out short runs. Inasmuch as die costs continue to increase, we are very much interested in the possible use of less expensive temporary dies for use in connection with short runs of our product.

If it develops that the article the writer has in mind appeared in one of the issues of your magazine, we shall sincerely appreciate your furnishing us with a copy of that particular issue, marking it for the personal attention of the writer, and ask that any charge or cost involved be invoiced to us in the regular manner and we will remit immediately upon receipt of your invoice.

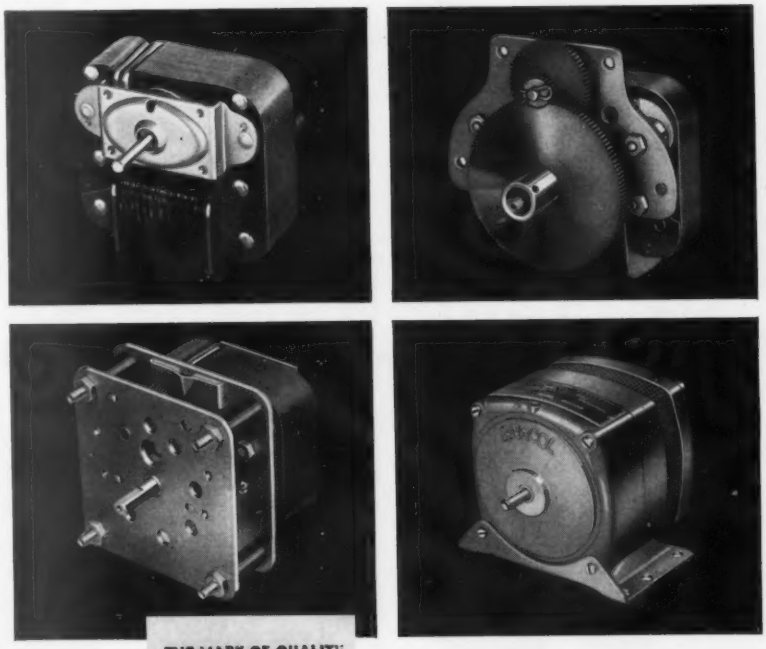
**Lloyd F. Lamm, President**
**Chicago Thrift-Etching Corp.**
**Chicago, Ill.**

Two articles from MPM were mailed: "Plastic tools simple to make" — January, 1959, and "Improved tooling method permits medium production runs" — October, 1959.

The Editors

*to Page 104* →


*Barber-Colman motors offer wide range of power and speeds, plus long-life quality that adds extra product value, extra product economy*



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## a-c small motors

Wherever the application calls for a *highly dependable* small motor with unusual power or speed requirements (and all at low cost), you'll most likely find the answer at Barber-Colman. Geared types feature torques up to 300 lb-in. with speed ranges from 1/6 revolutions per hour up to 1500 rpm. Nongeared models are rated up to 1/20 hp at 2900 rpm. All are built to high-quality standards . . . for long, trouble-free service that eliminates bothersome costly maintenance of your product. Yet your cost per motor is surprisingly low.

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HIGH STARTING TORQUE
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PRODUCT NEWS FROM *Pfizer*

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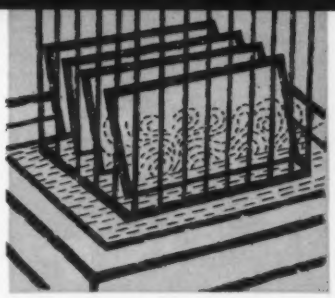
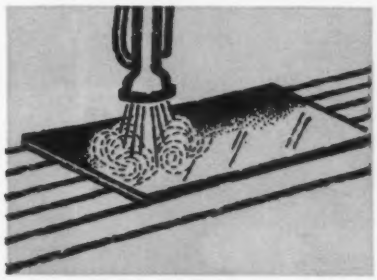
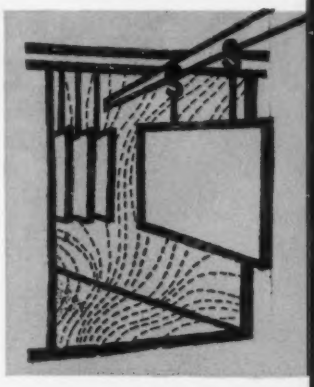


**1** Pickle in citric bath



**2** Apply cover coat frit directly.

**3** Fire in existing equipment.



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In this new Ray-Davis* process, only cover coat enamel is required. The ground coat step is completely eliminated. Although adequate process controls are needed, no special handling technique or major installation of equipment is required.

Mail in the coupon below for complete technical information on this important new porcelain enameling development.

## Important advantages of the Ray-Davis Direct-On process

- No special handling of pickled steel is required.
- No major installation of special equipment necessary.
- Uses non-premium type steels.
- Easy to handle—citric is a dry, non-toxic, water soluble acid.
- Only one application of frit.
- Doubles oven capacity.

***Developed by W. G. Ray, Chas. Pfizer & Co. and Shipp C. Davis, Daco Corp.**

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Mail this coupon to.

**CHAS. PFIZER & CO., INC. CHEMICAL SALES DIVISION**
**630 Flushing Avenue, Brooklyn 6, N. Y.**

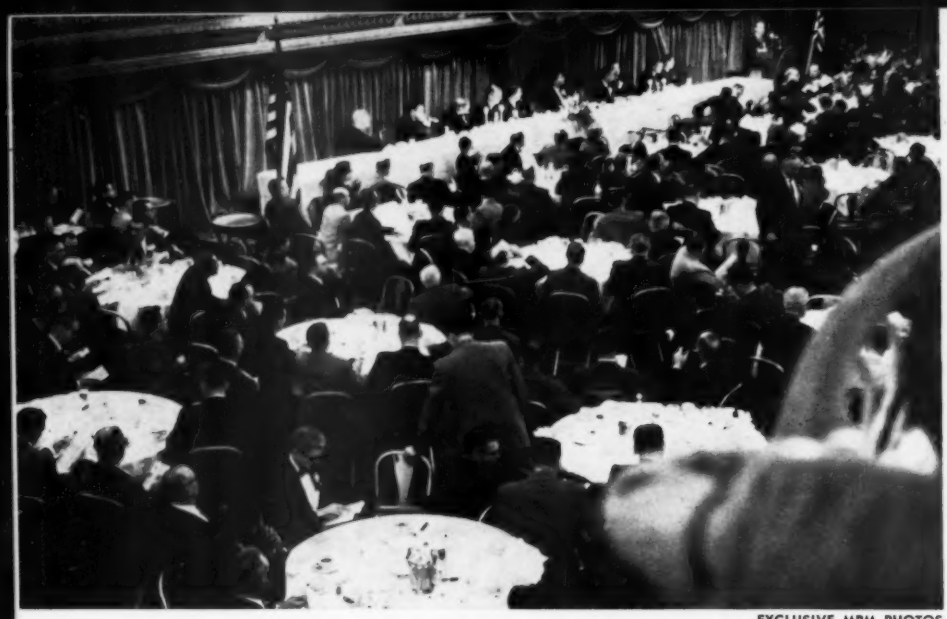
Please send me: ☐ Technical Information
☐ Sample of steel porcelainized by Ray-Davis process

Name_____

Company_____

Address_____

City_____ State_____



EXCLUSIVE MPM PHOTOS

*AN MPM STAFF REPORT*

# 3,000 attend First El

THE ELECTRIC HEAT INDUSTRY celebrated a robust adolescence and toasted a promising future at the First National Electric House Heating Symposium and Exposition.

Sponsored by the Electric House Heating Equipment Section of the National Electrical Manufacturers Association, the exposition in Chicago's Hotel Sherman, March 21-23, was attended by over 3,000 electrical manufacturers, utility representatives, electrical distributors and contractors, bankers, architects, builders, and electrical inspectors. Seventy-four firms exhibited. The registration figure was one of the major indications of the show's success, since the NEMA staff had anticipated a much smaller attendance.

C. F. Kreiser, chairman of the Electric House Heating Equipment Section, and general sales manager of the Edwin L. Wiegand Co., reflected the mood of the meeting when he said that six million homes will be heated electrically in 1970. From the industry's early efforts in 1950, when there were only 150,000 electrically heated homes, statistics point up an increasing acceptance of electricity as a heating fuel, Kreiser commented. In 1955, 350,000 homes were heated electrically; the figure has jumped to almost a million today, and the projected figure for 1965 is 1,800,000.

Kreiser also noted that the current prosperity of the supplementary heating industry is indicated by the fact that home owners have invested $23 million in electric heating units for attics, spare rooms, bathrooms, playrooms, and other similar locations. This business will continue to grow, he said, and should reach cumulative expenditures of $72 million in supplementary heating units by 1965, and $191 million by 1970.

Seminar speakers at the three-day meeting discussed a variety of subjects concerning electric heat, including sales promotion, application of the National Electrical Code to electric heating installations, controls, standards, insulation techniques, selection of heater types for various dwellings and locations, electric rates, and the market for electrical contractors and distributors.

### FHA and electric heat

One of the featured speakers was W. Beverley Mason, Jr., assistant commissioner for technical standards of the Federal Housing Administration. His subject was "FHA Looks at Electric Heat." He described how electric heat in its early years had an uphill battle in trying to receive recognition from FHA officials. In some local offices there is still reluctance to accept electric heating, he added, although the general FHA policy on electric heat is much more favorable than it was ten or even five years ago. Mason commented that it was wrong to condemn or accept electric heat without considering the "total housing expense," which includes installation cost, maintenance, etc.

The importance of standards for electric heating equipment and its performance was stressed by Lowell R. Mast, director of engineering for the Electromode Div., Commercial Controls Corp. He said conflicting and sometimes extravagant claims confuse today's consumers. "Without widely accepted standards for its product, the electric heating industry realizes it will continue to be running the risk of gimmicks and gadgets of little value being sold to trusting consumers. And the whole industry suffers incalculable harm when the consumer discovers that he has been taken for a 'sucker'."


*(Upper left) — A portion of the crowd which jammed the Grand Ballroom of Chicago's Hotel Sherman at the special industry luncheon.*

*(Upper right) — W. Beverley Mason, Jr., addressing electric heat industry representatives at the Special luncheon. Mason is with the FHA.*

*(Left) — A portion of the exhibit set up by White-Rodgers Co.*

*C. Fred Kreiser, chairman of* NEMA *Electric House Heating Equipment section.*

He went on to say that a set of standards has been prepared by NEMA, and that the industry must "respect and promote" these standards to create public confidence.

**Utilities cooperate**

The major partners of the electric heating equipment manufacturers are the utility companies, so it was logical that several power company representatives were included on the speaking schedule. Alfred C. Sangster, Detroit Edison Co., in discussing the topic, "Electric Heating Has Come of Age," stated that electric heat is no longer promoted only in areas where electric rates are low. "In many instances it is being sold on its own merits without any special rate inducements." He added that the manufacturer should continue to develop better and more salable equipment and strengthen his distributor and dealer organizations.

Looking to the future, Stanley B. Aronson, sales manager of Berko Electric Mfg. Corp., said the key to future growth of electric heating is the ability to purchase equipment "without obstacles of any sort being placed in the purchaser's path." He elaborated by saying that until recently a consumer desiring to heat his home electrically often encountered only mild enthusiasm at the utility level and received partial cooperation from electrical contractors. "During this period electric heating was purchased . . . not sold."

The picture has changed today, Aronson continued, for electrical contractors, utilities, distributors, insulation people and others are assisting in the introduction of electric heating to home owners.

EXCLUSIVE MPM PHOTO

*Joseph F. Miller,* NEMA *managing director, speaking at exposition luncheon.*

*Representative of Wesix Electric Heater Co., explains company's products to visitor.*

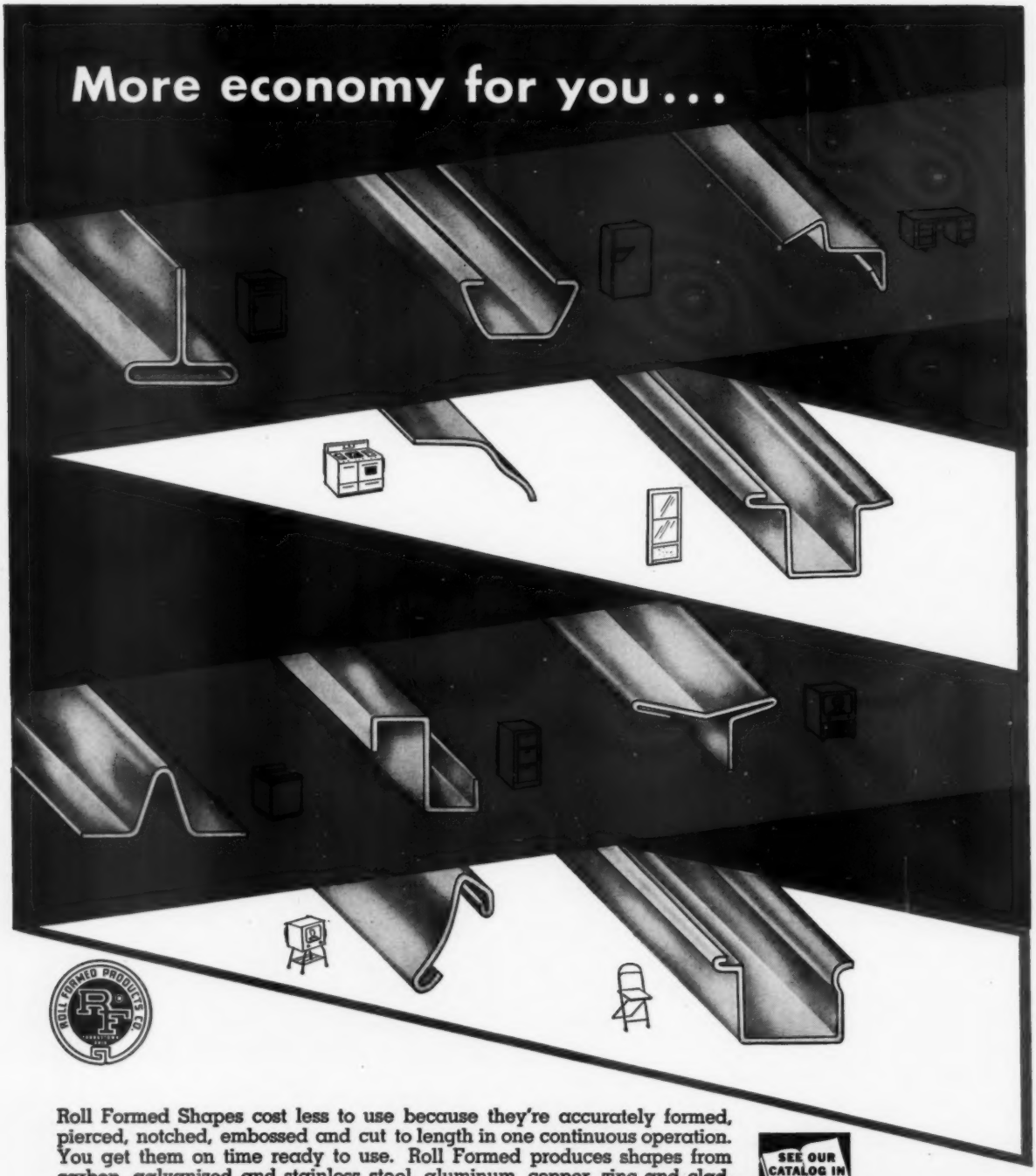

EXCLUSIVE MPM PHOTOS

# irs Electric Heat Exposition

*(Below) — Discussing exhibits are (left to right) Dick Paxton, sales engineer with The Wilcolator Co., Mrs. Joseph E. Kumler of Ranco, Inc., and Dave Marshall, assistant general sales manager of Wilcolator.*

*(Right) — A portion of electric heat exhibit hall.*


# More economy for you . . .



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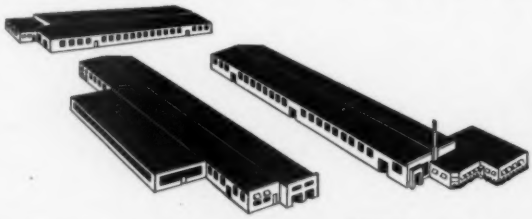

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# PMI looks at the space age

## new materials, techniques discussed at annual spring technical meeting

*AN MPM STAFF REPORT*

EXCLUSIVE MPM PHOTOS

HOW DOES THE SPACE AGE affect the metal stamping industry? What is the state of the metal stamping art in Europe, and what can we learn by looking outside our own borders?

These topics dominated the 11th Annual Spring Technical Meeting of the Pressed Metal Institute in Cleveland, Ohio, March 21-23. The comprehensive program also included timely discussions of modern stamping equipment, safety programs, ultrasonics, abrasives, and drawing compounds.

Aldo Coen, president of Alpha Products, Inc., Chicago, Ill., outlined the challenge that European stamping plants offer American firms. Based on his extensive tour of European stamping companies, Coen presented some ideas that contradicted generally accepted conceptions of European manufacturing.

He agreed that some American manufacturers were purchasing pressed metal parts from European firms because of price advantages. He differed, however, with the common thinking as to why Europeans can compete effectively on a cost basis. Better production techniques, rather than cheap labor and materials, are often the deciding factors, Coen commented.

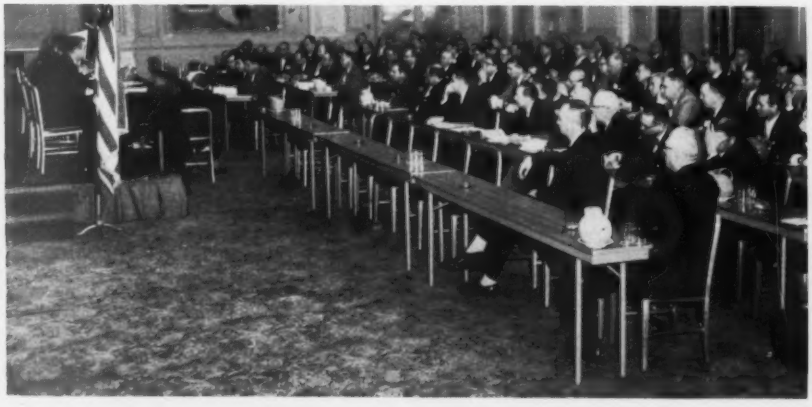
He backed up his opinion by explaining that labor costs on stamped parts are generally a small percentage of the total cost, and that import duties the United States places on such items usually negate any cost advantage Europeans gain from lower factory wages. Coen concludes that production efficiency, made possible by high degrees of automation, minimum amounts of downtime, and rapid die changes, are often the real reasons for the low unit cost of European products.

Coen's report, while not particularly comforting to the 235 representatives of the metal stamping industry at the meeting, did make the point that American firms are not up against a hopeless situation. Where we are competing in terms of production efficiency rather than labor costs, which are virtually a "fixed" expense, the contest is decided by initiative and technology. On these grounds, Coen feels, we can meet the challenge of European competition.

To back up his comments on the productivity of European stamping plants, Coen showed a color movie depicting the manufacture of parabolic reflectors

*(Above) — PMI members examine parts produced by modern metal stamping techniques. The parts were on display throughout the meeting. (Below) — Session titled "Facts About Presses" drew a large audience.*

*Wilbur Carlson, winner of the John Woodman Higgins Redesign Award, shows the pole piece he redesigned as a stamping and the winning certificate.*



*Donald Jackson (left) and Ray Larson, both of Larson Tool & Stamping Co., examine map showing proposed route of* PMI*'s 1961 European tour.*

by an Italian stamping company, Costruzioni Meccaniche Benelli, of Florence. The film was flown to Cleveland by Giorgio Gavazzi, a representative of the Italian firm, to insure the film's arrival in time for the meeting.

The reflectors, manufactured for the Fiat Motor Co., are produced completely automatically, from the blanking operation to the finished piece, on a circular, progressive-die press.

In line with the international flavor of the meeting, PMI Managing Director

*Aldo L. Coen, president of Alpha Products, Inc., discussing stamping techniques employed in European shops.*

Harold A. Daschner announced a 35-day technical tour of Europe sponsored by PMI. The tour will begin in Rome, Italy, and end in London, England. The purpose of the tour, according to Daschner, will be to allow American members of the metal stamping industry to do some "brain picking" of their European counterparts. The group will leave New York April 8, 1961, and return May 14.

The tour will climax with the First International Conference of the Metal Stamping Industry, in London, May 9-10. Six countries are expected to participate in the conference.

### Space age metal stamping

One full session was devoted to the materials and techniques required for space age metal stamping. Robert S. Aikenhead, works manager of Woodings-Verona Tool Works, Verona, Pa., described his company's efforts to find new or improved methods of forming and stamping space age metals. The methods the firm has been concentrating on include explosive forming, backward extrusion, deep drawing, and cold extrusion.

Aikenhead said he considers explosive forming one of the most "exotic" of the new methods, since it has the advantages of speed and low die cost. Laboratory experiments in backward extruding zirconium have been encouraging, he said, and some pilot tests in severe deep draws of tool steels have given favorable results. He noted that he includes stainless steel and certain tool steels in the "exotic metal" class, since these materials may be used in the construction of space vehicles.

Another exotic metal, beryllium copper, was discussed by L. Dean Alspach, manager of technical development, Brush Beryllium Co., Cleveland, Ohio. Alspach said beryllium copper is finding increasing acceptance in the appliance, automotive, and electrical fields. Along with having hardenability in the range of many steels, he noted that the material has the ability to be severely formed and heat treated to give good spring properties. Alspach also said that beryllium copper strip can be readily blanked, formed, deep drawn, or spun by standard production methods, and it can be joined by soldering, silver brazing, or resistance welding.

Following Alspach's talk, Herbert Jahnle, chief metallurgist of The Budd Co., Philadelphia, gave a slide presentation on his company's experience with forming and working exotic metals.

The remaining two speakers on the "space age" panel delved into the subject of ultrasonics in a stamping plant. Brett Hollerith, applications engineer with Branson Ultrasonic Corp., Stamford, Conn., spoke on cleaning applications of ultrasonics. He said one of the ideal uses for ultrasonic cleaning is for parts requiring the ultimate in cleanliness, such as missile components and semiconductors. After a brief outline of the fundamentals of ultrasonic clean-

*to Page 127* →

*Panel discussing safety code for power presses drawn up by the American Standards Association includes (from left) T. A. Kraklow, Deere & Co.; Henry B. Duffus, Westinghouse Electric Corp.; Arthur S. Kelly, National Safety Council; Norman Dunlap, The Minster Machine Co.; and Leroy A. Faulkner, Liberty Mutual Insurance Co.*

*Session titled "Facts About Presses" featured panel consisting of (from left) T. R. Vaucher, Niagara Machine & Tool Works; David Bonnar, Clearing Div., U.S. Industries, Inc.; Robert Hoefler, Verson Allsteel Press Co.; and James K. Wingard, Press Div., E. W. Bliss Co. Standing is Harold A. Daschner,* PMI *managing director.*

*"Stamping Space Age Metal" was the topic covered by (from left) John C. Smack, Princeton Div., Curtiss-Wright Corp.; Brett Hollerith, Branson Ultrasonic Corp.; Herbert Jahnle, Research & Development Div., The Budd Co.; L. Dean Alspach, Brush Beryllium Corp.; Robert S. Aikenhead, Woodings-Verona Tool Works; and Fred F. Rimmler, Vol. kert Stampings, Inc.*

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*Kroger Building, Cincinnati, Ohio, under construction.*

# Questions and an
# on metal cu

**exclusive MPM interview with Wall Division, National Asso**

WITH AN INCREASING NUMBER OF BUILDINGS employing curtain wall construction, which is tending to change skylines across the country, MPM editors felt that the answers to some of the commonly asked questions concerning this comparatively new, but fast growing development would be of interest to many MPM readers.

An interview was arranged with a representative group from the Metal Curtain Wall Division, National Association of Architectural Metal Manufacturers, and the results of that informal interview are reported in this feature.

*Question — In referring to a "typical" curtain wall building, is any one particular metal out in front as far as curtain wall construction is concerned?*

MR. THOMAS — There are many successful curtain wall installations using either aluminum, stainless steel, or porcelain enameled steel. There are even some installations using a combination of all three products. Aluminum is the predominant product now being used in metal curtain wall. I feel that the future for metal curtain wall lies in cooperation between the many factors involved, both in material and craftmanship. Since the majority of curtain wall today is still made of masonry products, the metal producers and curtain wall fabricators should be concentrating on quality products in order to capture a larger share of the available market.

MR. SMITH — We are not trying to sell one basic metal; we are trying to sell *metal curtain wall* as such, and therefore we tackle our approach for sales on the advantages of metal curtain wall over other conventional materials.

Our company takes the attitude that any metal material that is logical for curtain wall should be used. We have used aluminum, bronze, and stainless steel quite extensively.

*Question — On Wacker Drive, in Chicago, the Executive House represents* a new curtain wall *building with stainless steel exterior. Less than a block away is the Oxford House Motor Hotel, which represents a rehabilitation project and includes* exterior surfacing *of porcelain enameled steel. Which do you feel represents the greater opportunity between* these two *types of application?**

MR. SMITH — Our company feels that curtain wall, that is, the complete new building, is the better of the two possibilities. In New York, for example, there is considerable rezoning taking place and this, in many cases, means tearing down old buildings and replacing them with new. As far as we are concerned, the rehabilitation market is one that is important and one that can be tapped, but for the long run future, we are far more interested in new building work with curtain wall.

*Panels on the Executive House consist of 26-gauge stainless face, a one-inch foam glass core, and galvanized steel backup. The Oxford House Motor Hotel exterior surfacing consists of insulated porcelain enameled curtain wall panels over existing masonry. Windows and mullions are aluminum.

*Question — Is heat loss a problem in the metal curtain wall buildings?*

MR. WITHEY — One fallacy that occasionally creeps up in comparing types of walls is concerned with the question of heat loss or heat gain through a wall. This is more a function of the design of the building than it is the type of wall. In other words, the amount of glass area or uninsulated area is perhaps the biggest single contributor to heat loss or heat gain.

MR. SMITH — In line with that comment, our greatest problem in heat gain or heat loss is that the architect or the owner, or, in some cases, the critics of metal curtain wall, fail to acknowledge that there are windows in masonry buildings. Quite often there is less window area in a curtain wall building than there is in a masonry building, and if you take the heat loss through a normal masonry building which has a great deal of

# nanswers
# tacurtain wall construction

**rviewwith representative members of the Metal Curtain**
**ionaAssociation of Architectural Metal Manufacturers**

window space in it and compare it to a normal curtain wall building, the result may be quite comparable.

*Question — How do costs compare between a typical curtain wall building and a typical masonry building?*

MR. SMITH — First, I would like to point to one fallacy in bidding on jobs where there is to be an alternate bid between metal curtain wall and masonry construction. Normally these bids are sent out with an alternate for the two faces or for the two types of construction, but no allowance is made for the lighter structure required (also foundation) for curtain wall.

Per square foot, metal curtain wall is cheaper than masonry. We not only figure the wall value in computing this, but we also figure in the value of the reduced structure, the framing for the structure, and the foundations which can be lightened up to a great extent when metal curtain wall is employed.

*Members of the Metal Curtain Wall Division, National Association of Architectural Metal Manufacturers, who were interviewed are (from left): J. M. Roehm, Kawneer Co., Niles, Mich.; Ralph McKenzie, Flour City Ornamental Iron Co., Minneapolis, Minn., vice president of* NAAMM *and president, Metal Curtain Wall Div.; John Hunt, The Alumiline Corp., Pawtucket, R. I.; O. A. Thomas, Jr., Reynolds Metals Co., Richmond, Va.; R. K. Humke, Minnesota Mining & Manufacturing Co., St. Paul, Minn.; William H. Withey, Armco Steel Corp., Middletown, Ohio; and Gordon H. Smith, Albro Metal Products Corp., New York, N. Y.* EXCLUSIVE MPM PHOTO

*Four Gateway Center Building, Pittsburgh, Pa.*

Our second approach concerns space saving. With wall thicknesses two inches or three inches versus twelve inches or sixteen inches, there is a worthwhile space saving in square footage of floor area, which can be readily calculated into use value or rental value.

Our third approach relates to speed. If a company is going to build a building and is going to be paid rent from the time it is finished, then they want to build it as quickly as possible. Prefabricated assemblies most certainly close a building much faster. It is also possible to start at the bottom and install panels, with the glass man following immediately without waiting until the building is topped out. This is not possible with masonry construction.

*Question — Can you offer some case history information relating to weight saving and space saving?*

MR. WITHEY — The Miami Beach Federal Savings & Loan Building in Miami Beach, Florida, represents another case in point. We understand that 4,300 square feet of space was gained by the use of curtain wall construction versus masonry. Additionally, the masonry wall would have weighed 1,290 tons. By contrast, the steel curtain wall weighed 180 tons. This means a net saving of 1,110 tons of dead load with a consequent reduction in size and cost of structure and foundation.

The Puget Sound Power & Light Building in Bellevue, Washington, gained 1,450 square feet of additional floor area by using curtain wall construction.

Looking at it another way, assume a saving of six inches in thickness of the wall. This is not out of line, as most curtain walls are two inches compared with a minimum of eight inches

for masonry. In a building 100 × 200 feet, twenty stories high, renting at $6.00 per square foot per year, this would mean additional income of $36,000 per year.

*Question — What can we say about the permanence of the "metal skins?"*

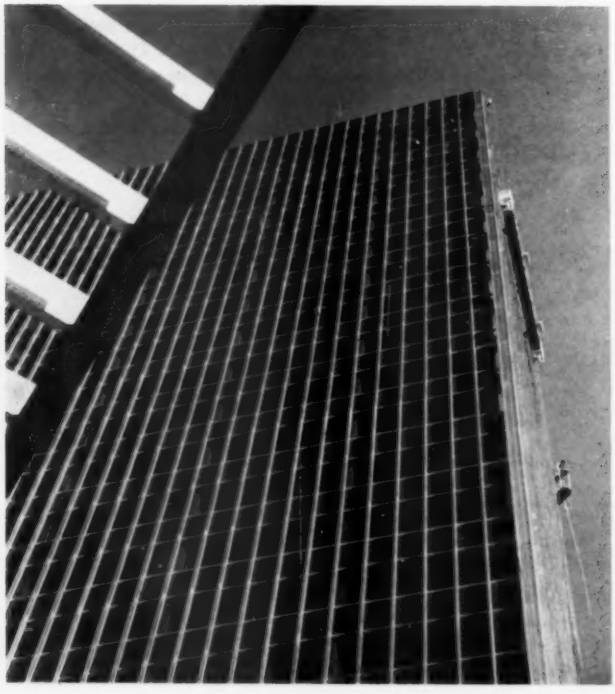
MR. WITHEY — While the metal curtain wall is usually considered a relatively-new form of construction, dating back perhaps to 1948, there are numerous earlier examples of the use of metals on the exteriors of buildings, dating back 25 to 30 years. Such jobs as the Chrysler Building in New York City have considerable aluminum and stainless steel on the exterior that indicate the durability of these materials. The old Union Carbide Building on 42nd Street in New York City has steel spandrels that date back 25 years and are still in topnotch condition.

MR. THOMAS — We could also refer here to the aluminum spandrels on the Empire State Building, which date back to 1930 and are still in excellent condition, after having very little maintenance.

MR. WITHEY — Our own Armco Research Laboratory, which was constructed of porcelain enamel facing panels about 22 years ago, has had only two washings in the succeeding interval. This constitutes the entire maintenance on the building and, while an accumulation of dirt is evident, the metal itself is in good condition.

MR. THOMAS — Back in 1931, James Bolton, engineer and former assistant director, Department of Public Works, Richmond, Va., designed and supervised the construction of the first true metal curtain wall building in the United States. Aluminum was chosen as the curtain wall material. The two-story plus basement building has not only stood up well through the years, but has also survived a move from its original site to a new location.

*Another view of the Four Gateway Center Building.*



*Question — Is there a possibility that the metal facing may become de-laminated from core materials when sandwich panels are used?*

MR. HUMKE — It is admitted that, during early experience in sandwich panel fabrication, through either improper selection of adhesives or poor workmanship in application of the adhesive to the core or facing, there were some examples of de-lamination. This problem has been met by improved techniques, both in adhesive compounding and in the application of the materials. By way of reassurance of the durability of adhesives in such applications, we can point to the use of many of these products in structural bonding applications in aircraft. In the building industry, there has been a growing trend away from the use of pan-type panels to panels which represent the direct lamination of the core and face materials, using adhesives.

*Question — How is condensation handled in the metal curtain wall field?*

MR. HUNT — Condensation in the panel areas of curtain walls has been the subject of many controversial discussions. We feel that, except for some cases of improperly designed panels and spandrel areas, condensation should not be a problem which cannot be properly handled by design.

Some buildings are designed for operations which will feed an excessive amount of moisture into the air, such as dairies and laundries, etc. This moisture should be removed by special equipment for that purpose, such as de-humidifiers, to prevent excessive condensation on exterior and interior walls.

In the panel areas of most buildings, the proper design of panels and spandrel areas would control condensation. Providing air space between the exterior panel facing and panel cores would help by reducing the temperature variation between the exterior and interior of the facing material. A good design of spandrel areas allows for free movement of air over the face of panels to help dissipate moisture.

*Question — How serious a problem is condensation?*

MR. MCKENZIE — I think that architects are aware of condensation, such as the condensation problems on transparent areas of glass, and they take care of this by providing through their heating and ventilating equipment for a movement of air past the glass which will remove the condensation.

Also, condensation gutters are provided at the sill, usually in the removable stop, in instances where no provision is made for movement of air past the glass.

This is a common problem in all building construction, whether masonry or metal curtain wall construction is used. In any kind of panel or glass spandrel construction, where there is an air space behind face material (between the face material and the insulation), provision should be made for a movement of air by provision not only of weep holes, but also ventilation holes at the top member.

*Question — Is expansion and contraction a serious problem in metal curtain walls?*

MR. MCKENZIE — There is no more problem in expansion and contraction of metal curtain walls than in any other part of the building. Expansion and contraction are something the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architect takes for granted in the design of the entire building, and he should give as much consideration to expansion and contraction in metal curtain wall as he does to expansion and contraction in the building structure as a whole.

There are expansion joints in the building, but most people are not aware of them. Expansion and contraction of curtain wall is something that people worry about unnecessarily, because they don't understand that this same problem occurs in any material used for building, not only for metal. You do have more expansion and contraction in metal than in some other materials, but expansion and contraction in any material is one of the physical properties of that material and cannot be avoided.

This brings up the question of sealants, and there is no "miracle" answer to this question. Expansion-contraction requirements, location or accessibility of the joint, and temperature range to which the completed wall will be subjected, are some of the factors affecting selection of sealants.

The number of joints or contacts that must be closed with gaskets or sealants during erection should be kept to an absolute minimum. The sealing of joints in the fabrication shop is part of a well-planned procedure under proper light and temperature conditions, and immediate inspection is part of this procedure.

*Question — What can you tell us about research and development in this field?*

MR. ROEHM — One of the first problems we saw before us in the Research and Development Committee was to pull together an organized body of technology on metal curtain wall construction. It is a new industry, it is a new product, and one which "grew like Topsy" without many people knowing exactly what they were doing. Our Research and Development Committee thought that the only way we could hope to get better curtain walls was to put down the requirements and spell out the technology needed to meet the requirements for good performance.

One result of our efforts has been the publication of a metal curtain wall manual which we hope will be helpful to the architect. It sets forth how he should prepare his specifications so that a fabricator can build a wall to meet the specifications, so that when this wall is built and erected, it will perform well.

Our manual also includes a section on reference standards. These standards set forth what may be expected from the different types of metals and how they should be used. It covers the area of sealants, which has been one of the areas that has needed the most work on standards.

I believe that not only can we put insulation in the panels to control heat losses, but it is perfectly possible that we can start putting our heating elements right in these panels — thereby putting the heat control or even the cool control on the skin of the wall where it should be. The wall could even take advantage of electroluminescence, which is another rapidly developing science, so that these walls may serve as a light source, to supplement daylight from the window area.

There are many interesting developments relating to *color* in curtain wall construction. We have seen color come into the wall through the use of porcelain enamel on metal, and there are now new developments in the field of aluminum through anodizing processes which should give us metallic looking colors with corrosion resistance that is many, many times greater than what we have had available in the past.

*(One aluminum producer has reported a non-fading, gold-colored aluminum sheet for architectural use, with the source of the color inherent in the alloy.)*

Factory fabrication has given us a degree of control which is not possible in the field. The curtain wall concept will be considerably expanded in the future. There will be lamination of different types of metal panels, in different shapes, and the use of a variety of textured materials and finishes. We will be getting away from the stark gridwork that has typified curtain walls to date.

*Question — Who should be responsible for the finished curtain wall installation?*

MR. ROEHM — We strongly recommend, and have followed the practice in most companies, that the fabricator of the metal curtain wall is responsible for the fabrication and installation in its entirety. Where curtain wall is sold through a contracting organization, we would expect the dealer to stand behind his installation and we, in turn, back him up for any faults in material that may occur.

*Question — Mr. McKenzie, your company has issued a booklet, "A guide to custom metal curtain walls." Won't you give us a few highlights from this publication?*

MR. MCKENZIE — *Relating to tests*: The static pressure test cell is the most accurate controlled method of testing for air and water infiltration. In any rainfall, the wind velocities are intermittent. The constant pressures of a test cell will effect maximum testing of leakage.

Wind load data, testing procedures, and a description of standard testing equipment will be found in the "Metal Curtain Wall Manual" published by the National Association of Architectural Metal Manufacturers.

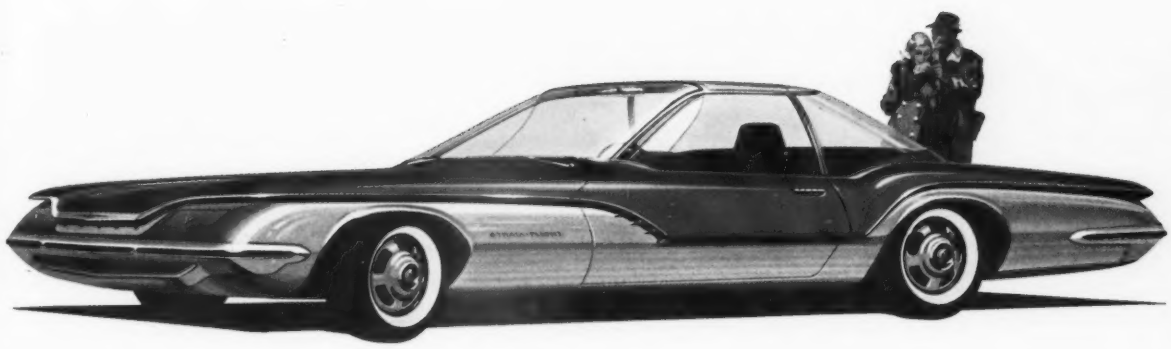
*Fabrication limitations*: Metals and other curtain wall materials are available from the mills in larger sizes and longer lengths than can be economically used in architectural construction. There are machines available to fabricate these large sizes of material, and finishing plants capable of mechanically and chemically finishing them. But these facilities cannot be maintained by curtain wall fabricators for the rare occasions they might be used. Such facilities are available to curtain wall fabricators on a job basis, but the cost may offset any savings anticipated by the use of unusual sizes. Architects should consult fabricators as to availability of unusual facilities.

Although produced by mass production techniques, the curtain wall may have an assembly line a thousand miles or more distant from the fabricator's plant. Materials handling of each end of this line is no problem, but transportation between these two points may seriously affect the cost or the design.

*Laminated panels*: Panels range from skin types, with a thin rigid core primarily used to keep the metal flat, to fully insulated types providing the ultimate in contemporary panel construction. Fully laminated panels have certain details in common: metal sheets are cemented to a rigid core material or, where the core is not rigid enough, are cemented to rigid boards which are cemented to the core.

There should be little or no contact between the interior and exterior sheets, so as to prevent thermal transmission. Thermal "breaks" may be employed or the nature of the panel construction may prevent this transmission.

The exterior metal sheet can be anodized aluminum, porcelain enameled aluminum, stainless steels, porcelain enameled steel, or bronze. The interior sheet, if exposed, may also be any of these finished metals or galvanized steel, painted, may be used. Concealed interior sheets are usually galvanized steel.



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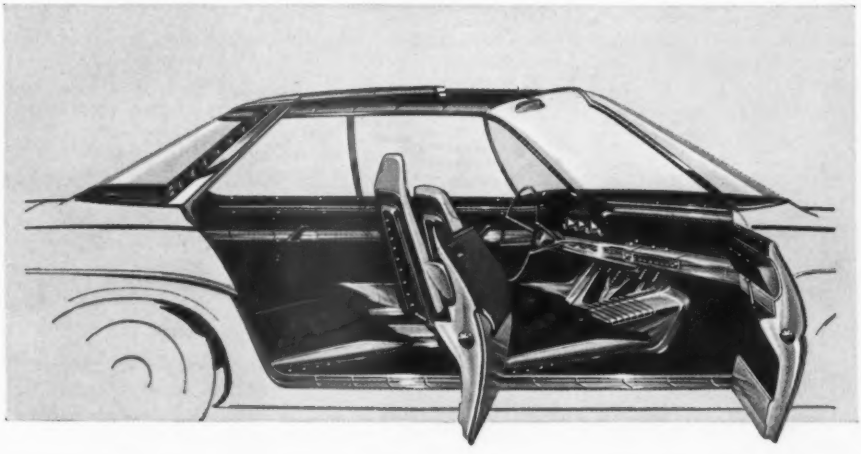

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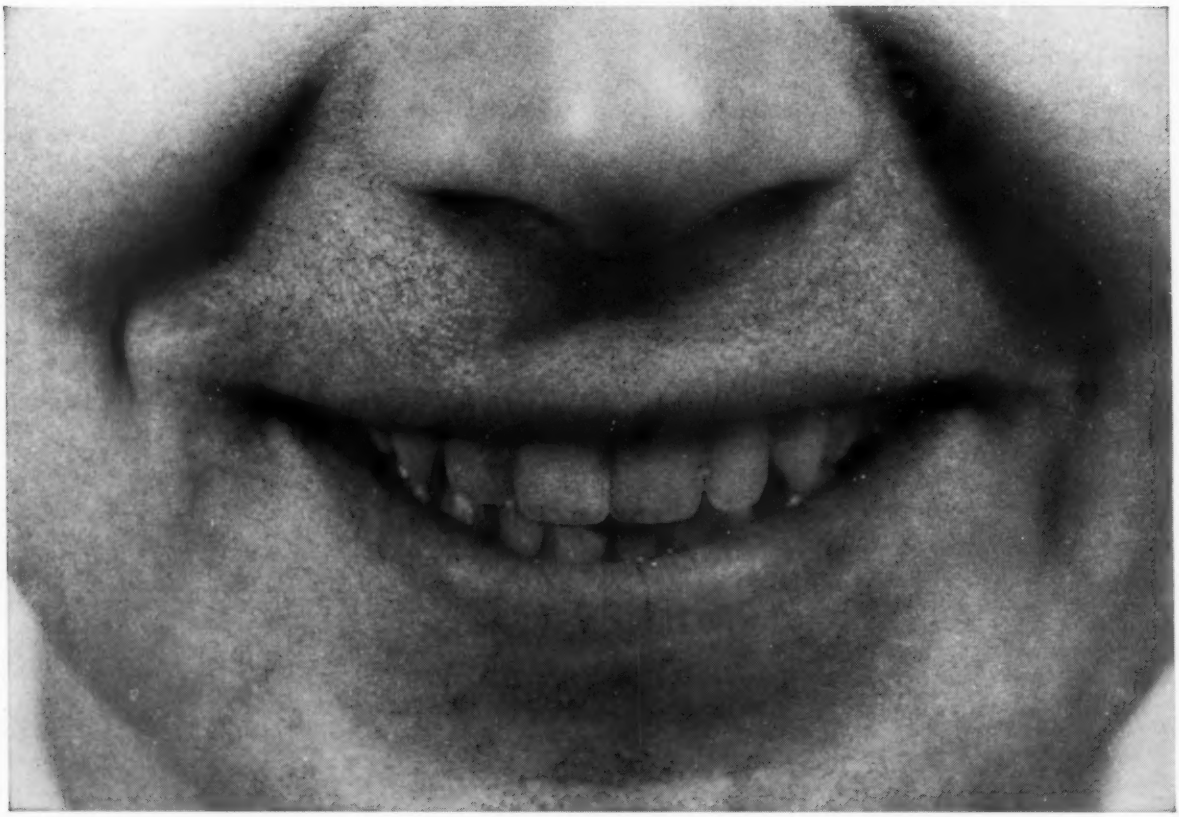

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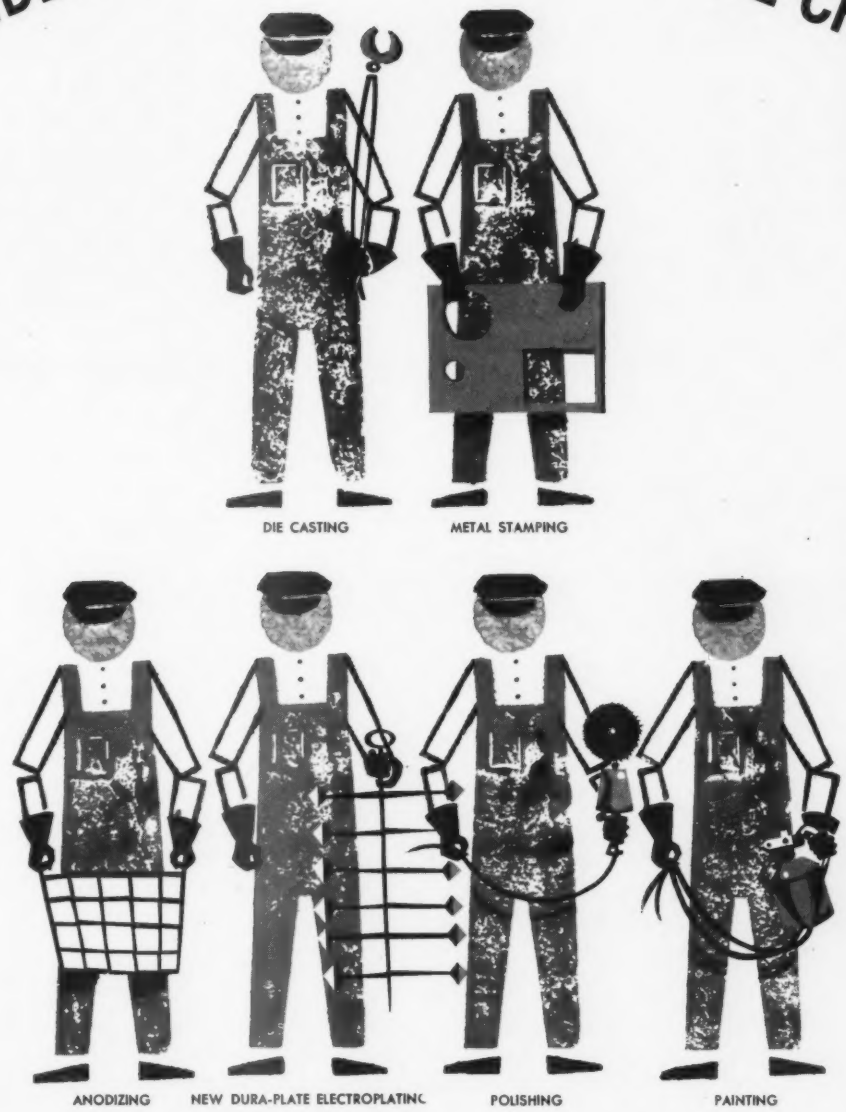


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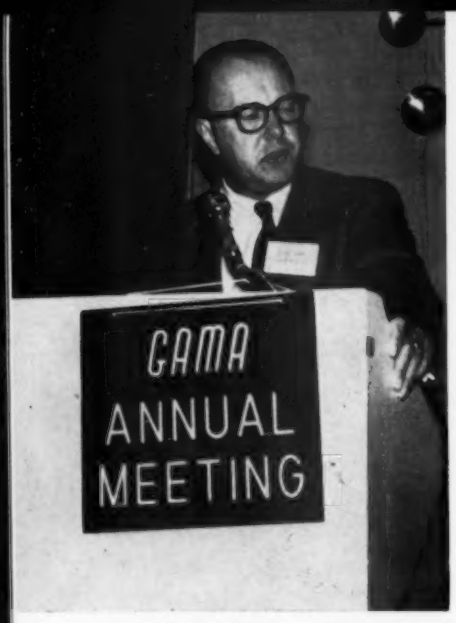
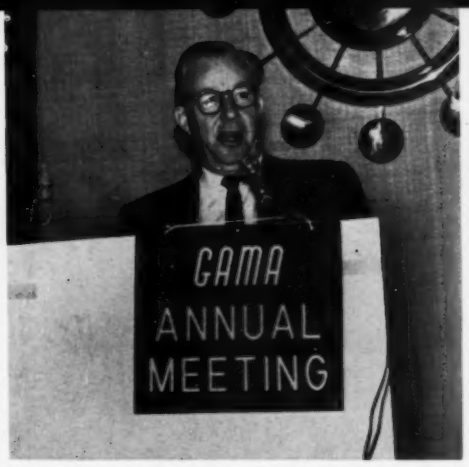



*Clifford V. Coons, Rheem Mfg. Co., chairman,* GAMA *Nominating Committee.*




*C. S. Stackpole, managing director, American Gas Association.*

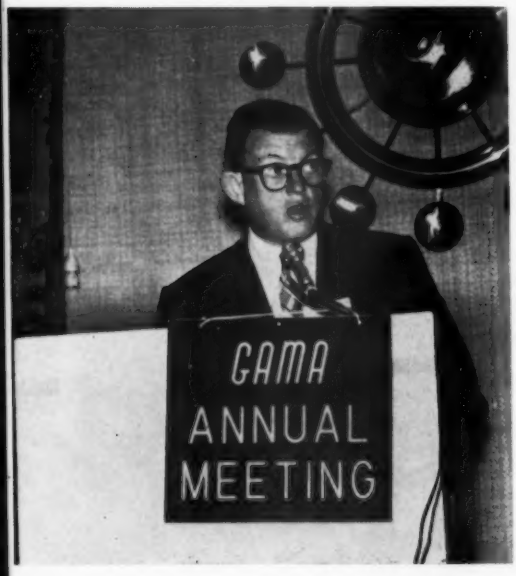

*Edward A. Norman, (right) president Norman Products Co., outgoing president,* GAMA, *passes the gavel to Wendell C. Davis, president, Cribben & Sexton Co., and president-elect* GAMA.

AN MPM STAFF REPORT

EXCLUSIVE MPM PHOTOS

# GAMA expects volume up 8 per cent i

## members are warned of increased competition a




THE GAS APPLIANCE INDUSTRY — which last year sold 9,100,000 pieces of household equipment, bringing total units in use to 107,000,000 — expects at least eight per cent more business this year and, by 1965, a sales increase of 50 per cent over the current annual rate.

Predicting that sales volume will reach $2,725,000,000 in 1960, E. A. Norman, outgoing president of Gas Appliance Manufacturers' Association, told the group's 25th annual meeting at The Greenbrier, White Sulphur Springs, W. Va., that combined gas industry revenue, including utility gas, bottled gas and appliance sales, will top $9 billion this year. That would be nearly 20 per cent higher than in 1955.

*(Left) — Thomas Lane, senior vice president, Lennen & Newell, Inc.*

"In the next five years, we look for new housing, home modernization, and equipment replacement to create a situation where the average home will be using at least five major items of gas equipment instead of one, as of a decade ago, or three-plus, as of now," he said.

Norman, who is also president of Norman Products Co., explained that 45,000,000 homes in the U. S. now use 34,000,000 gas ranges, 43,000,000 pieces of gas heating equipment, including central and room heaters, 24,000,000 gas water heaters, and a total of more than 7,000,000 gas dryers, refrigerators, incinerators, gas air-conditioning systems, and gas lamps.

Sixteen million of the gas ranges in use are more than 10 years old, he stated, adding that "The industry is taking dead aim at this huge replacement market for ranges and other obsolete home equipment."

Last year, Norman said, seven out of ten new homes were gas-heated, five out of nine installed gas ranges, and four out of five adopted gas for water heating. The ratio of electric clothes dryers to gas dryers which, he said, had been nearly 10-to-1 a decade ago, closed to less than 2-to-1 in 1959, and "We expect something closer to a dead heat for the dryer market this year."

Norman stressed the gas equipment industry's decision to continue its "War on obsolescence in homes, plants and institutions," but emphasized that it

*(Below, left to right) — J. E. Kern, assistant secretary,* GAMA, *and director of manufacturer services, Pacific Coast Gas Assn.; William G. Hamilton, Jr., president of American Heater Co. and first vice president,* GAMA; *and Donald I. Rogers, business and financial editor, New York Herald Tribune.*

*(Left to right) — Harold Massey, managing director, GAMA; Wister H. Ligon, president, AGA and president, Nashville Gas Co.; Wendell C. Davis, president, Cribben & Sexton Co. and president-elect, GAMA; Frank C. Smith, chairman, AGA Gas Industry Development Committee, and chairman of the board, Houston Natural Gas Corp.; and C. S. Stackpole, managing director, AGA.*


*Wister H. Ligon, president, AGA, and president, Nashville Gas Co.*

*E. A. Norman presenting an original oil painting to Charles Warwick in recognition of his long work as chairman, GAMA General Traffic Committee.*

# ent in 1960 — 50 per cent by 1965

## tition and a threat to our free enterprise system

"Has no intention of resorting to forced obsolescence." He described forced obsolescence as the "mere changing of model numbers and the creation of a perennial inventory headache for distributors and dealers without giving them something truly new to sell."

**New concepts**

Harold Massey, GAMA managing director, reported that more than 5,000 new products or functional product changes have been submitted to the industry's central laboratories in Cleveland and Los Angeles in the past year for testing and approval.

"I've seen more new concepts developing through gas industry research in the past year or two than in all of the other 35 years I've spent in this business," he said.

*Frank C. Smith, chairman, AGA, Gas Industry Development Committee, and chairman of the board, Houston Natural Gas Corp.*

**The element of competition**

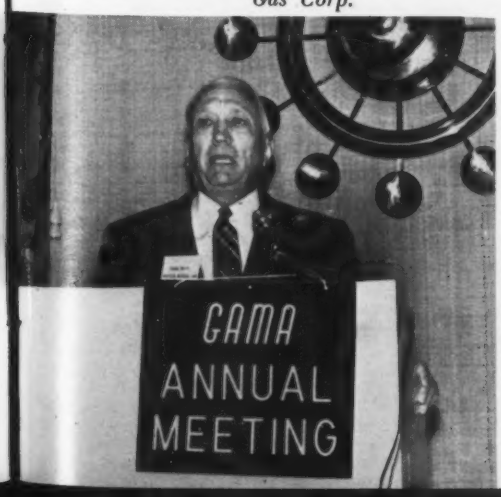
Wendell C. Davis, president-elect of GAMA, stated in his presidential address, "No one can deny that the sixties will be bigger, more aggressive, and more opportunity-laden than the past decade. Any economist who did not view the economic and marketing expansion of the coming decade with unbridled optimism, was asked to turn in this Phi Beta Kappa key. Just how big will the sixties be? Well, we are told that we will have progressively expanding markets — big markets with unparalleled buying power. They will establish an era of record family formation, construction, population, and production. Just saying, however, that coming markets will be bigger than anything we have yet seen, is not a definitive statement.

"I have just finished reading an economic report which places the sixties in clear and understandable perspective. It says simply that, during the next ten years, the growth in national output; the increase in production; and the increase in personal consumption will be equivalent to the growth which has been attained over the past 25 years."

Davis went on to state, "Yes, the 1960's loom as big and opportunity-

to Page 44 →

*(Below, left to right) — Wendell C. Davis, president, Cribben & Sexton Co., president-elect, GAMA; W. H. Dalton, managing director, Canadian Gas Assn; and John F. Ray, vice president, sales, General Controls Co., second vice president, GAMA.*

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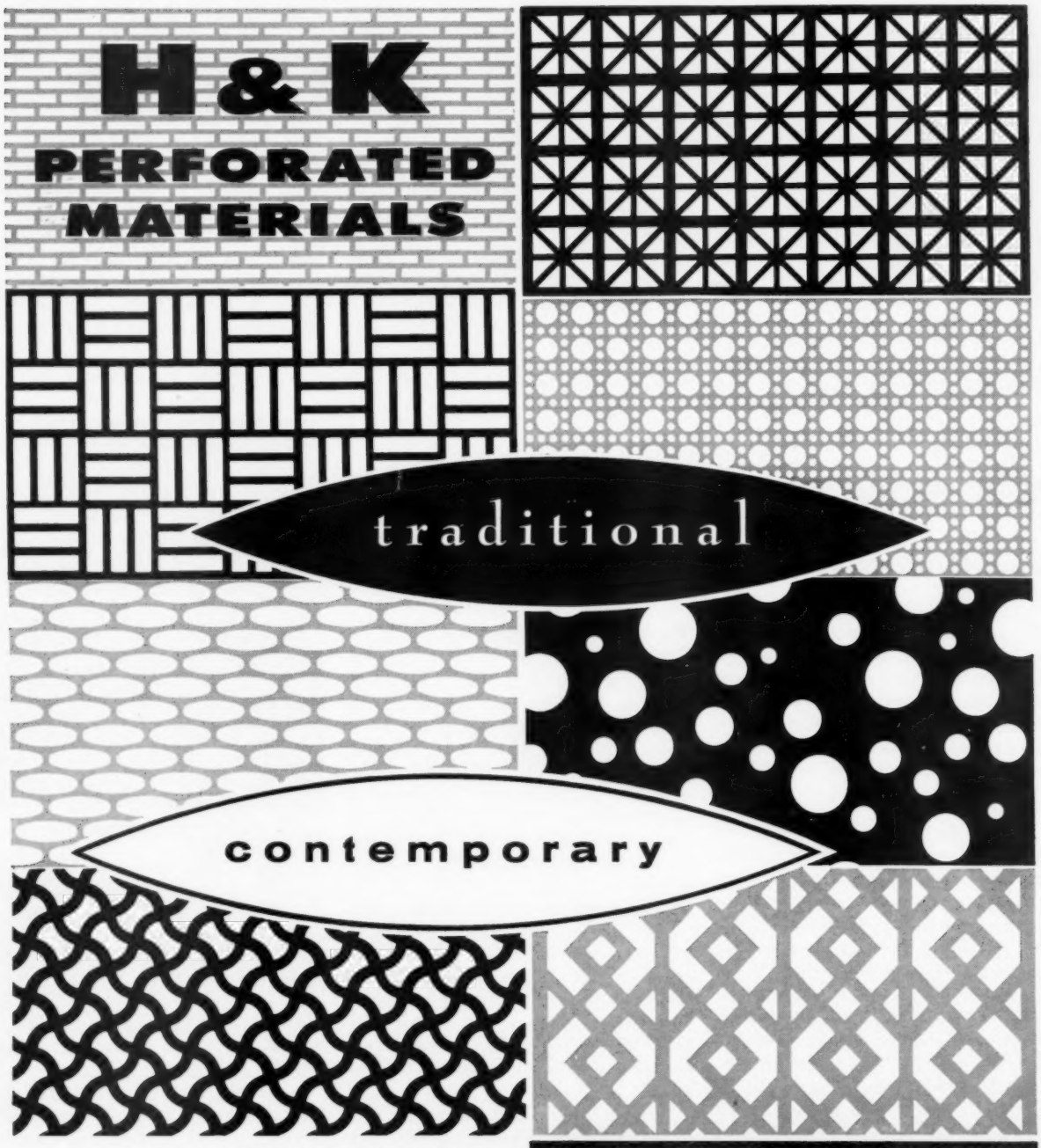


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*Elisha Gray II, chairman of the board, chief executive officer, and director, Whirlpool Corp., delivered the keynote address, "Who Benefits from the Annual Model Change?"*

# AHLMA Technical Conference

## 300 attend highly successful conference

AN MPM STAFF REPORT

THE ENGINEERING AND RESEARCH Committee of the American Home Laundry Manufacturers' Association sponsored its first Technical Conference at the Sheraton Towers Hotel, Chicago, March 24. It proved to be well received and had excellent attendance. Originally, the organization had expected an attendance of approximately 100 — 289 registered.

D. W. Lynch, manager, engineering home laundry department, General Electric Co., was conference chairman. He was assisted by committeemen G. James Alaback, general manager, laundry engineering, Whirlpool Corp., and George Allen, director of engineering, Herrin Div., Norge Sales Corp. George D. Conlee, chief engineer, Speed Queen, served as moderator for the session on plastics.

The keynote luncheon address was delivered by Elisha Gray II, chairman of the board of Whirlpool Corp., who spoke on "Who benefits from the annual model change?" He said the question of the value of model changes has been obscured by semantics and sometimes sneering references to the phrase "planned obsolescence." "An engineer's principal purpose as an engineer is to create obsolescence. Any attempt by various people to 'toady' to the public by saying they are against planned obsolescence is commercial demagogy." Without the tremendous rate of obsolescence created by professional people and engineers, "the average person's life would include tremendous measures of hardships and sadness and unnecessary toil to a degree that is hard for us to recall."

He listed the four principal reasons for model changes as: the introduction of a basic product improvement of value or use to the customer; the incorporation of an improvement which affects quality or reduces cost; the need to provide fresh merchandise which will stimulate and maintain enthusiasm in the salesman and the customer; and the need to meet marketing moves by competition.

Gray challenged engineers to provide a "happy combination" of condi-

*to page 127*→

*(Left to right) — E. G. Lipski, Philco Corp.; Guenther Baumgart, president, American Home Laundry Manufacturers' Ass'n.; P. J. Fynn, director, Research Laboratory, J. C. Penny Co., Inc.; and J. Doblin, Illinois Institute of Technology.*

EXCLUSIVE MPM PHOTOS

*(Below) — Speakers on the morning session on Reliability and Measurements are (from left): R. H. Gabriel, engineering manager, Engineering Test, Home Laundry Dept., General Electric; D. W. Lynch, manager, Engineering, Home Laundry Dept., General Electric, conference chairman; C. H. Fuchs, supervising engineer, Electric Appliance Div., Westinghouse; R. G. Clapp, Operations Research-Analysis, Philco.; and L. F. Israel, engineering director, LaPorte Service Center, Whirlpool.*

*(Below) — Speakers during the morning session on "Plastics, a Problem, in Application Engineering" are (from left): G. D. Conlee, chief engineer, Speed Queen, moderator; F. D. Dexter, assistant director of development, Union Carbide Plastics Co.; Owen Skelton, vice president and general manager, Modern Plastics Corp.; W. H. Farrell, associate managing engineer, Underwriters Laboratory, Inc.; and C. F. Abresch, engineering manager, Washer Engineering, Hotpoint.*

## GAMA

→ *from Page 41*

laden. We can easily visualize more people, more families, more spendable income, and more production amounting to almost Utopian markets. But the one element no one can afford to miscalculate is the element of competition. Competition during the sixties will be bigger, more dynamic, and more rugged than ever before. Competition will be in tune with the opportunities of the market place."

Davis closed by saying, "We should plan our progress and growth, as individual manufacturers, with realistic boldness — and see to it that our programs are kept in tune with current and projected economies. The sixties are opportunity-laden — but they guarantee nothing. It's up to us to make the 1960's a decade of growth and expansion for ourselves, our companies, and our industry."

### A threat to free enterprise

Donald I. Rogers, business and financial editor, New York Herald Tribune, had a warning for GAMA members. He started his talk by stating, "I came here prepared to give you a glowing and cheerful preview of the economy for the months ahead. I can certainly point a rosy picture for this year of 1960. It should turn out to be our most prosperous year in history. Gross national product at an alltime high. Savings towering at a record. Spendable income reaching new heights. Profits at a new peak. All of the good, solid economic indicators setting new marks and making new achievements.

"If I were intent merely on cheering you up, I could recite the pretty facts and figures for the lush year of 1960. If, however, I am to do my job as an objective reporter and as an impartial student of the nation's economy and its politics, I cannot, in conscience, be so cheerful. I must, in conscience, tell you of the impending dangers to our way of life as I see them from whatever vantage point is afforded me in my job as an observer."

Rogers then said, "We are going to have at least three major economic problems in the sixties and it behooves us to start recognizing them for what they are. The first is the threat of a continuously rising trend in unit labor costs . . . higher and higher production costs . . . with the resultant inability for us as a nation to maintain a high level of economic activity and a high level of employment. What I'm saying, bluntly, is this; if labor costs continue to rise in the sixties, we may be unable to maintain our economic prosperity . . . and, as a result, there will be less, not more, employment. The second problem is a likely shortage of venture capital. This will have an immediate effect in limiting long-term economic growth in the land. The third problem will be posed by the growing economic strength of the other industrial nations of the world. We will have stiffening competition with these other industrial nations not only abroad, in world markets, but right here in America. The picnic is over."

Rogers concluded, "In time, I submit, we will find our manufacturing processes as mired in government help as is our agricultural industry. And there goes our free enterprise. I state these facts deliberately to scare you, for I feel it my mission to arouse the thinking businessmen of this nation. Our free enterprise system is slipping away from us faster than most of us realize. We must prohibit by law industry-wide union bargaining. We must find, somewhere, a political party with courage enough to do it. We must see to it that there are enough corporations in any one industry to keep free enterprise alive."

### New officers

New officers for GAMA are: president, Wendell C. Davis, president of Cribben & Sexton Co., Chicago; first vice president, William G. Hamilton, Jr., president of American Meter Co., Philadelphia; second vice president, John F. Ray, vice president in charge of sales for General Controls Co., Glendale, Calif.; treasurer, Stanley H. Hobson, chairman of the board and president of George D. Roper Corp., Kankakee, Ill.; and secretary, Harold Massey, managing director, GAMA.

### Division officers

Newly-elected officers, named in order of chairman, vice chairman and executive committee members, were as follows:

*Direct Heating Equipment Division* — Walter G. Ullman, president of the Siegler Heater Co., a division of the Siegler Corp., Centralia, Ill.; Robert H. Norris, president of the Dearborn Stove Co., Dallas, Tex.; Frederick H. Martin, vice president of the Martin Stamping and Stove Co., Huntsville, Ala.; George H. McFadden, president of the Ohio Foundry and Mfg. Co., Steubenville, Ohio; and Louis C. Vandertill, vice president and director of sales of the Duo-Therm Division of the Motor Wheel Corp., Lansing, Mich.

*Gas Boiler Division* —Lauren E. Seeley, vice president of engineering for the H. B. Smith Co., Inc., Westfield, Mass.; Gordon Cheasley, plant manager for the Richmond Plumbing Fixtures Div. of the Rheem Mfg. Co., New Castle, Del.; and W. W. Popyk, manager of engineering service for the National-U. S. Radiator Div. of the Crane Co., Johnstown, Pa.

*Gas Clothes Dryer Division* — E. A. Nash, director of gas appliance sales for Norge Sales Corp., a subsidiary of Borg-Warner Corp., Chicago, Ill.; Richard H. Smith, vice president of Blackstone Corp., Jamestown, N.Y.; and Harry M. Kane, manager of Laundry Div. of Whirlpool Corp., St. Joseph, Mich.

*Gas Conversion Burner Division* — R. I. Warnecke, executive vice president of the Roberts-Gordon Appliance Corp., Buffalo, N.Y.; Joseph F. Capoun, president of the Columbia Burner Co., Toledo, Ohio; and Charles A. Reichelderfer, director of engineering and production for the Nu-Way Corp., Rock Island, Ill.

*Gas Furnace Division* — Gordon Rieley, general manager of Lennox Industries, Inc., Columbus, Ohio; Samuel F. Shawhan, president of Bryant Mfg. Co., Indianapolis, Ind.; and E. W. Gettinger, chief engineer of the American Furnace Co., St. Louis, Mo.

*Gas Incinerator Division* — Robert Dollar, vice president of sales for the Majestic Co., Inc., Huntington, Ind.; LeRoy Klein, vice president in charge of sales for the Caloric Appliance Corp., Jenkintown, Pa.; and E. M. Douthat, Jr., sales manager of the Locke Stove Co., Kansas City, Mo.

*Gas Refrigerator Division* — George E. Stevens, general manager of the Whirlpool Corp., St. Joseph, Mich.; and E. A. Nash, director of gas appliance sales for the Norge Sales Corp., a subsidiary of the Borg-Warner Corp., Chicago, Ill.

*Gas Unit Heater and Duct Furnace Division* — Clarence D. Scott, vice president of Sterlairco, Inc., Westfield, Mass.; Harold P. Mueller, Jr., executive vice president of the Mueller Climatrol Div. of Worthington Corp., Milwaukee, Wis.; and Cary Wilson, vice president of sales for the Modine Mfg. Co, Racine, Wis.

*Gas Vent and Chimney Division* — J. R. Allen, manager of dealer sales for the Transite Pipe Div. of the Johns-Manville Sales Corp., New York, N.Y.; Jack Schmidt, product development manager of the Van-Packer Co. Div. of the Flintkote Co., Carbon Cliff, Ill., and Fay O. Suffron, director of research for the Ameri Vent Div. of the American Metal Products Co., Inc., Los Angeles, Calif.

*Gas Wall and Floor Furnace Division* — Stanley F. Skafte, director of engineering for the Utility Appliance Corp., Los Angeles, Calif.; Lee A. Brand, vice president of the Empire Stove Co., Belleville, Ill.; and Marvin Stark, vice president of engineering for the Peerless Mfg. Div. of the Dover Corp., Louisville, Ky.

*Gas Water Heater Division* — D. W. Proulx, national product manager-water heaters, Rheem Mfg. Co., Chicago, Ill.; D. Richard Whitney, water heater sales manager for the Day and Night Mfg. Co., La Puente, Calif.; and Harry Lasky, vice president of sales for the Pennsylvania-Bradford Appliance Co., Philadelphia, Pa.

*Heavy Duty Forced Air Heater Division* — M. Everett Barnard, manager of the Unit Heater Department of the Carrier Corp., Syracuse, N.Y.; M. H. Stern, sales manager of the Industrial Heating Div. of Lennox Industries, Inc., Des Moines, Iowa; and Charles E. Snyder, sales manager-heaters for the Machinery Div. of the Dravo Corp., Pittsburgh, Pa.

*Relief Valve Division* — Nils W. Swanson, vice president of McDonnell and Miller, Inc., Chicago, Ill.; J. Kenneth Lund, director of technical services for the Dole Valve Co., Morton Grove, Ill.; and Everett N. Garrett, plant superintendent for the Kitson Valve Div. of the Welsbach Corp., Philadelphia, Pa.

The following divisions renamed 1959 incumbents: Automatic Controls Div., Domestic Gas Range Div., Gas Appliance Regulator Div., Gas Valve Div., and Industrial Gas Equipment Div.

Three divisions of the association postponed election of 1960 officers until a later date. They are: the Gas Engine Compressor Div., Gas Meter and Regulator Div., and the Hotel, Restaurant and Commercial Gas Equipment Div.

# You can chute the works on Glidden finishes

Imagine finishes for metal products which can withstand the pounding and grinding action of a ton of coal rushing over their surface!

Coal chutes do not, of course, require a paint finish. But Glidden has developed and test-proven finishes which can take punishment under almost any conditions.

Glidden formulations are available to meet your particular requirements against unusual conditions of impact, humidity, heat, cold, corrosion, as well as abrasion.

Your Glidden salesman can give you full information on the best Glidden metal finishing system for your particular product or products.

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**FINISHES FOR EVERY PRODUCT**

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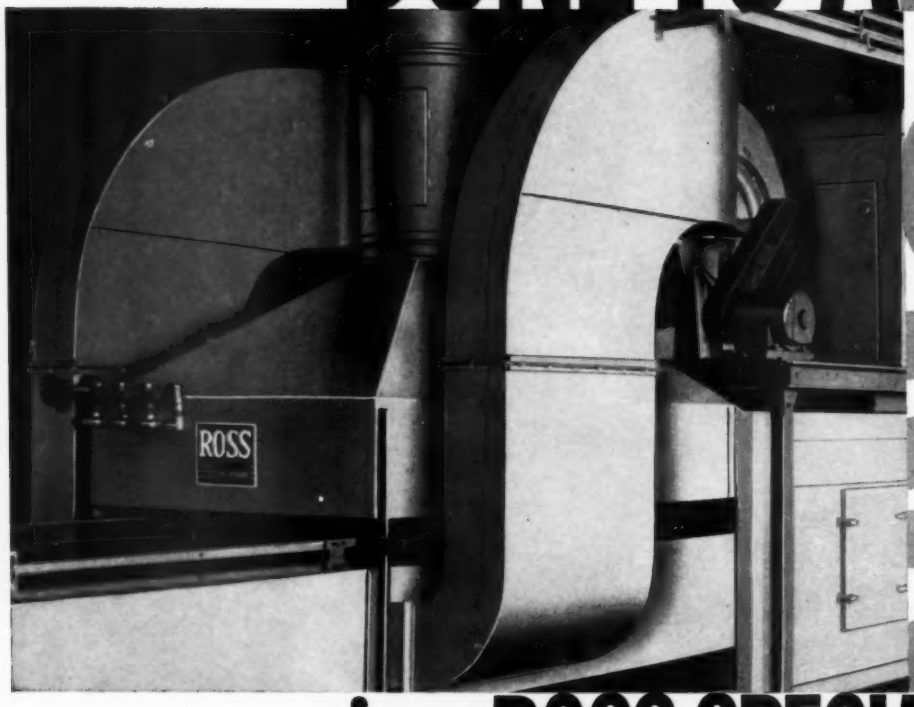
No matter what your product, process or problem, Glidden Finishes plus Glidden Technical Service can provide the answer.

# DONE TO A TURN




# in a ROSS SPECIAL OVEN

*Paint Finishing · Metal Decorating · Rubber Curing*
*Strip Coating · Laminated Products · Material Drying*

If yours is a product that needs to be baked or cured just so, you'll be happy as a clam with a ROSS Custom Oven. These ovens will meet performance specs on the nose... Ross Ovens will out-perform any other oven.

And ROSS can provide any and all types of ovens... Batch or Continuous, Straight-Pass or Multi-Pass, floor, overhead or tower, single-zone or multi-zone, one oven or a complete finishing line. ***Write today for Bulletin ID 300.***

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# Metal Products Manufacturing

## THE *Kelvinator* STORY

From Lord Kelvin to Foodarama 1960

Kelvinator
saves more than space
with ROLL-BOND evaporators
by OLIN

OLIN MATHIESON METALS DIVISION, East Alton, I
Producers of: Roll-Bond, Western Brass and Olin Alu


PHOTOS: COURTESY KELVINATOR DIVISION AMERICAN MOTORS CORP.

# Your appliances look new longer when treated with BONDERITE

To retain that factory-new finish on appliances over years of rough use in the home, manufacturers like Kelvinator apply Bonderite at the factory.

In service, Bonderite resists corrosion, ends peeling, flaking and lifting of paint, keeps finish damage from spreading when the paint is accidentally scratched or broken.

In the plant, Bonderite creates high quality, uniform coatings at production speeds and at lowest costs. Bonderite actually saves money by its trouble-free operation and the service-free performance it produces as it prolongs paint finish life.

*Your* fine product finish should have the protection of Bonderite under the paint. The Parker representative, backed by the organization that has led the field since 1914, will show you how Bonderite can improve your product and cut your costs.

**Parker Rust Proof Company**
2170 E. MILWAUKEE, DETROIT 11, MICHIGAN

BONDERITE corrosion resistant paint base • BONDERITE and BONDERLUBE aids in cold forming of metals • PARCO COMPOUND rust resistant • PARCO LUBRITE—wear resistant for friction surfaces • TROPICAL—heavy duty maintenance paints since 1883

Since 1914—Leader in the field

*Bonderite, Bonderized, Bonderlube, Parco, Parco Lubrite—Reg. U.S. Pat. Off.

PROTECTED BY Bonderite PARKER RUST PROOF CO. QUALITY CORROSION RESISTANT

# KELVINATOR uses this

# HOWARD

UNIT BEARING

FRACTIONAL H.P. MOTOR

Model 1075
2 pole, Unit Bearing
1/750 to 1/185 h.p.
Open or Closed
Construction

## for no-frost refrigeration


This is the little motor that keeps 17.8 cubic feet of Kelvinator refrigerator absolutely free of frost. No-frost Foodarama uses two of these motors to drive fan blades that keep cold air constantly circulating in the refrigerator and freezer compartments. Above all they *must* be dependable. Kelvinator chose Model 1075 (as have other leading refrigerator manufacturers) because it is engineered to perfection for this particular job. It needs no oiling . . . has a patented bearing construction that assures long, unattended life . . . carries a 5 year guarantee. It is also widely used for pump, gear box and other fan applications. Write for complete information.

POWERED BY HOWARD

**Other Howard Motors:** UNIVERSAL & D.C. 1/200 to 1 h.p. / INDUCTION 1/1400 TO 1/4 h.p. SHADED POLE 1/2000 to 1/8 h.p. / SERVO MOTORS / GEAR MOTORS / BLOWERS

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# Kelvinator 1960


## FEATURES



## FROM THE EDITOR'S DESK

In accordance with standard editorial policy at MPM, top management at Kelvinator Division, American Motors Corp., Detroit, was first consulted in connection with our plan for a special section on "Kelvinator 1960." The result was a plan for a section that would tell the story of Kelvinator, "From Lord Kelvin to Foodarama 1960."

Staff editors and photographers then spent the necessary time at the Grand Rapids plant to cover all major plant operations and select the products, equipment, and processes which it was felt would be of greatest interest to MPM readers.

From the very first, the Kelvinator Foodarama appeared to be the logical selection for our design feature. Selection was then made of the products and departments to be covered in plant production features.

This special 48-page section forms the center of a 138-page May, 1960 issue of MPM. It represents the eighth such special section in over 16 years of publication devoted to the leading manufacturers of home appliances.

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# KELVINATOR

## First to Use

## H. A. MONTGOMERY'S

# KOLD-LUBE

H. A. Montgomery's technical laboratories have developed KOLD-LUBE Process, Product No. DB 2311, a dry coat drawing compound. Kelvinator Division of American Motors Corporation was the first to realize the advantage of KOLD-LUBE DB 2311. Kelvinator has gained an overall 11 per cent savings in fabrication costs. They have saved 20 per cent in cleaning operations; 22 per cent reduction in scrap loss and have reduced down time by 25 per cent.

Since Kelvinator began using the KOLD-LUBE process - lines have been established in a number of other major appliance and automotive plants.

**KOLD-LUBE DB 2311 Offers You . . .**

Increased production
Reduction in scrap
No interference in welding
Reduction in die maintenance
Progressive die lubrication
Reduces steel quality and gage requirements
Indoor corrosion protection
Simplified inspection and removal
Reduction in labor and product inventory

ORIGINATORS OF

**KOLD-LUBE**

PRODUCTS

**H. A. MONTGOMERY CO., INC.**
**17191 Swift Ave., Detroit 3, Michigan**
**WRITE, WIRE OR PHONE for further information.**

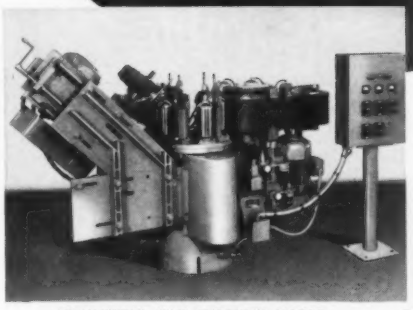
**Also Producers of:** A complete line of metalworking compounds

**Rapid Service:** To meet your ordinary or special requirements

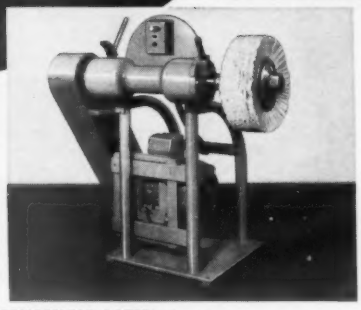
# MURRAY-WAY SPECIALIZED FINISHING EQUIPMENT

**JUNIOR FLAT POLISHER**—a compact, versatile, high quality production unit for economically grinding, polishing, or deburring flat surfaces of coils, sheets, blanks, bars, castings, or fabricated parts.

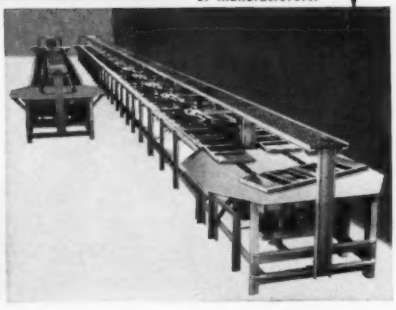
**HORIZONTAL-PLATEN CONVEYOR**—built to fit your exact requirements—slashes material handling costs for all types of manufacturers.

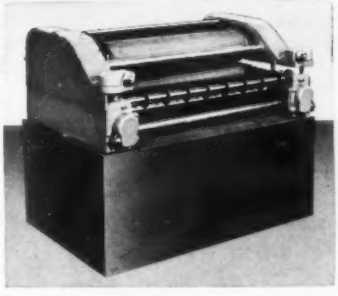


**POLISHING AND BUFFING TABLE**—this small dial table has abrasive belt head and buffing head for polishing and buffing spiral aluminum shapes. Available in large and small sizes.



**ECONOMICAL LATHE**—incorporates all the advantages of more expensive lathes, but is stripped of many unnecessary "frills" to keep costs to a minimum. Capacity from 10 to 20 HP.

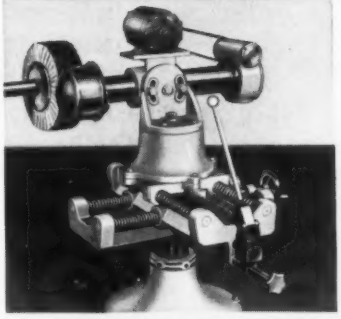




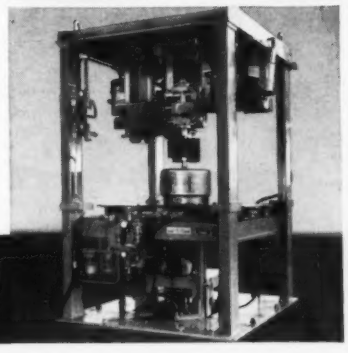
**ROLLER COATER**—a trouble-free, precision unit that coats one or both sides of a sheet. Easily accessible Vernier roll adjustments. Rolls removable without disturbing drive.

## ...IMPROVES QUALITY, REDUCES COSTS FOR METAL PRODUCTS MANUFACTURERS

**Polishing, buffing, grinding, filtering, deburring, materials handling . . . whatever your problem, Murray-Way equipment will do the job better and more economically. Fresh ideas based on a solid background of experience, enable Murray-Way's fine engineering and production departments to handle any and all of your production problems— large or small. The BETTER WAY is the MURRAY-WAY.**



**HAN-D-MATIC**—one standardized, low cost basic machine with interchangeable components to handle most buffing, grinding, and deburring jobs.



**WIRE BRUSH MACHINE**—quickly deburrs holes in automatic washer and dryer baskets prior to painting. Part of a completely automated line from load to unload.

MURRAY WAY

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# Praised by Practiced Homemakers . . .

LUX

## the finest in timer fashion and function

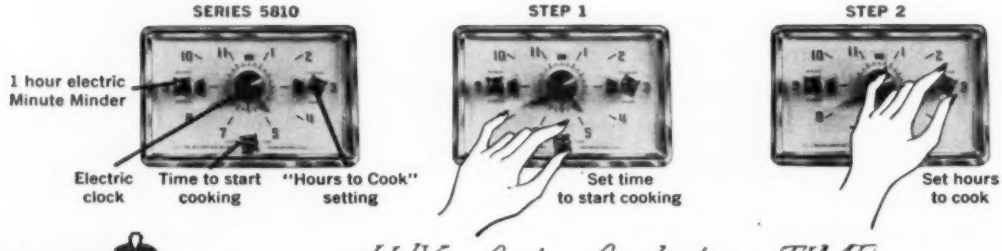
Today's hurry-up housewife—with her day devoted to various duties—looks for appliances that operate simply, function faithfully, demand little attention.

That's why the Lux timer—for ranges, dryers, washers—is praised by practiced homemakers.

*"We're proud to be part of the KELVINATOR team"*

These ladies know that the range with the Lux timer lets them out of endless supervisory minutes . . . that given simply the right start, Lux looks after what's cookin' until it's properly finished.

In today's keenly competitive appliance sales market, a product's reliability, fashion, and simplicity of operation are the keys to continuing customer satisfaction. The Lux timer's engineered construction and imaginative styling satisfy on all counts. Demonstrate the Lux timer today . . . nothing could be simpler.




LUX Time — YOUR TIME-REMINDER LINE

*LUX . . . first . . . for lasting TIME*

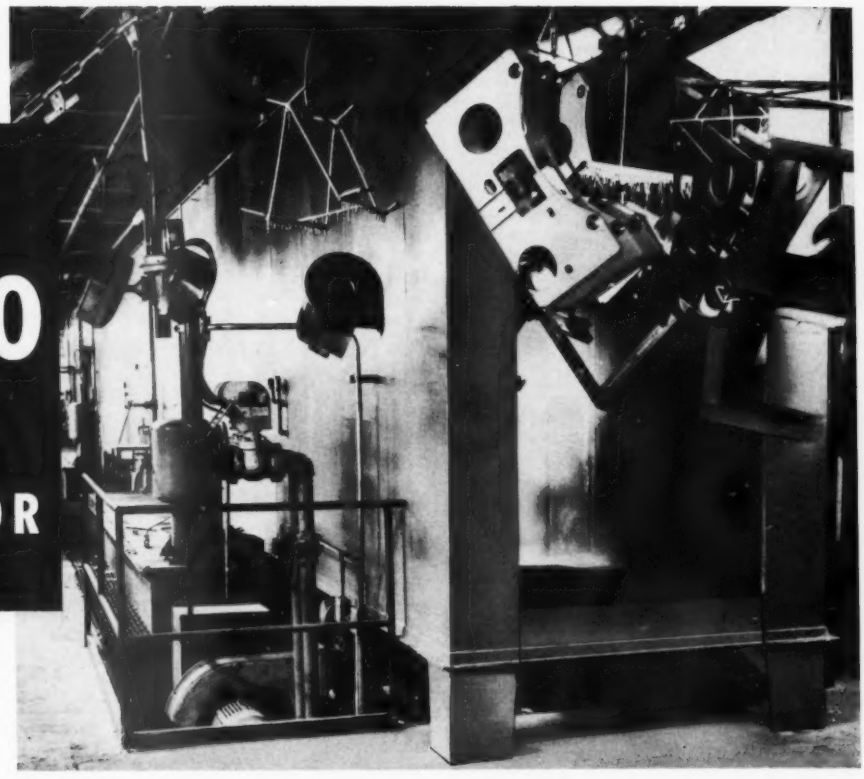
DEPARTMENT MPM

**THE LUX CLOCK MANUFACTURING COMPANY, INC.**

95 JOHNSON STREET • WATERBURY, CONNECTICUT

**Subsidiary: Lux Time (Canada) Ltd. Oakville, Ontario, Canada**

# WHY GRANCO AT KELVINATOR



*because . . .*

We like to feel it's because we are more than just a manufacturer of finishing systems. GRANCO is a firm of design specialists whose business is the custom engineering and fabrication of the total finishing system. At GRANCO we have the ability to design and fabricate or enlarge and rebuild part of or all of your finishing system.

GRANCO can supply you with an oven, furnace, washer, flo-coater or any other individual piece of equipment or we can supply the complete finishing system including conveyor equipment, spray booths and air supply systems. Each piece or the complete system is designed specifically for your operation.

GRANCO INC. is distinctive in its ability to do the whole job. When it's a GRANCO system there is no divided responsibility. The GRANCO name stands in front of every piece of equipment.

Whether it is one phase or the entire system, look to GRANCO for integration of the individual equipment or design and fabrication of the complete system.

**GRANCO of Grand Rapids . . . manufacturers of:**

- Ovens
- Furnaces
- Spray booths
- Parts washers
- Flo Coat systems
- Oven air heaters
- Bonderite systems
- Air supply systems
- Complete finishing systems
- Flameless gas burner systems

**GRANCO, INC.**

**317 32ND STREET, S.W.**

**GRAND RAPIDS 8, MICHIGAN**

# Aluminum parts give a good design excellence in Kelvinator's Foodarama

**KAWNEER** ROLLS, STAMPS, EXTRUDES, ANODIZES (IN ALL COLORS), APPLIES DECORATIVE PAINT, WELDS AND ASSEMBLES... AND RIVETS WIRE SHELVES... PROVIDING MANY OF THE ALUMINUM PARTS IN THE KELVINATOR FOODARAMA.

## Now then, may we help you?

***Call or write...***

Sales engineers available for your development work.
Inquiries handled promptly.

Serving Architecture and Industry

Kawneer CYNTHIANA, KENTUCKY APPLIANCE PRODUCTS DIVISION

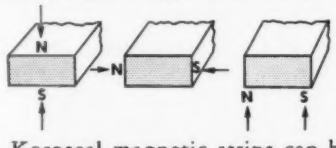
since 1906

# Look! A magnet that comes in flexible strips

**New uses for Koroseal magnet pop up every day. What can you make of it?**

KELVINATOR, known for its innovations in refrigerator design, was among the first to use B.F.Goodrich Koroseal magnetic strip. With this new material, refrigerator doors have a more positive seal, no longer need a latch. The magnetic pull of the strip used in gaskets draws the door tightly shut. Storm doors now stay closed in a similar way. Koroseal magnetic strip is even replacing zippers in garment bags.

Flexible Koroseal magnetic strip works just like a regular magnet—it's attracted to ferrous metals, or to itself—but it is more permanent than most conventional magnets, much lighter. And, unlike steel magnets, which can be magnetized lengthwise only with a "north" pole at one end and a "south" pole at the other, this Koroseal material can be magnetized in *any* direction along the entire strip. It can have poles on top and bottom, across the thickness, or along one face with the two poles along the edge. (See below)




Koroseal magnetic strips can be produced in continuous lengths in an unlimited number of shapes, ranging in size from spaghetti to garden hose. It can be cut without damaging its magnetism.

If you mass-produce a product and think Koroseal magnetic strip might improve it, or if you have an idea for a new product using this material, please write for full details. *B.F.Goodrich Industrial Products Co., Dept. M-843, Akron 18, Ohio.*

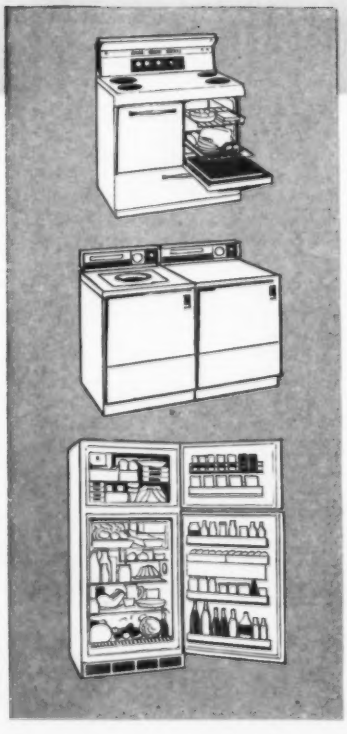
Koroseal—T. M. Reg. U. S. Pat. Off.

B.F.Goodrich

*A salute to*

# KELVINATOR

## FROM A "PARTNER IN PROGRESS" SINCE 1930



**Since 1930** Ferro and Kelvinator have been working together to produce better and better appliances for American Homemakers. And better *values*, as well — through development of *top-quality porcelain enamel finishes* at ever lower applied costs.

Ferro's "know-how" in porcelain enameling — combining as it does engineering, research, manufacturing, process controls at all stages of the customer's production — has contributed to substantial savings for Kelvinator making possible "better buys" for *their* customers.

FERRO

**FERRO CORPORATION**

4150 East 56 Street • Cleveland 5, Ohio

Nashville 11, Tennessee • Los Angeles 39, Calif.

THE STORY OF KELVINATOR BEGAN in 1914 when the founders took their first steps toward putting domestic mechanical refrigeration on a practical basis.

World War I was rumbling in Europe when Edmund J. Copeland brought Nathaniel B. Wales, a young engineer with an idea, to the office of Arnold H. Goss in Detroit. Struck by the immense potentialities in household mechanical refrigeration, Goss agreed to finance initial experiments, and a co-partnership with Copeland was set up.

*A typical production conference of the current staff at Kelvinator. At the head of the table is John Schuck, assistant works manager. The plant executives, clockwise, are: Gustave Syren, quality control department; Charles R. Evits, master mechanic; Scott Graham, superintendent cabinet assembly; John Pietrzyk, general superintendent of metal fabricating and organic finishing; John Schuck; Emerson Bogardus, superintendent cabinet weld fabrication; Walter J. Breuer, Grand Rapids products engineer; William T. Krapp, assistant to Breuer; and Craig R. Hitchcock, chief inspector.*

# Kelvinator — from Lord Kelvin to Foodarama 1960

Wales built his first refrigerating mechanism during the fall and winter of 1914 in Detroit, and the Electro-Automatic Refrigerating Co., Inc., was formed in May, 1916. In July of that year the organization was renamed the Kelvinator Co., in honor of Lord Kelvin, a distinguished 19th century English scientist who pioneered the discovery of the physical principles upon which mechanical refrigeration is based.

The early units consisted of the refrigerating system only, and were of the "remote" type, with the cooling unit installed in the purchaser's icebox, and the condensing mechanism in the basement. The company introduced its first self-contained unit in its 1925 line with the entire refrigeration unit installed in a specially built cabinet.

In 1926, the Leonard Refrigeration Co. of Grand Rapids, Mich., a large builder of ice boxes or "ice refrigerators," was acquired. Leonard got its start in 1881 when it introduced the first "cleanable" icebox. For many years before the merger, Leonard had produced cabinets for Kelvinator refrigeration systems, and the combination of the two old companies was natural. In the same year, Kelvinator merged with the Nizer Corp., one of the early leaders in the ice cream cabinet industry.

The merger of Nash with Kelvinator came at the end of 1936 after many months of negotiations. It represented one of the most unusual mergers because the production and marketing of automobiles and home appliances were vastly dissimilar. Time and experience proved it to be a logical and profitable business marriage.

Another significant change came in 1952 when the Altorfer Brothers Co., makers of ABC laundry equipment, was acquired. It provided a new and fast-growing addition to the company's household appliances and enabled the appliance division to step into an important product area quickly with a complete laundry appliance line.

ABC had a name and history in home laundry products that paralleled that of Kelvinator in refrigerators.

The company installed one of the first post World War II mass-production operations in the country. Called a "mass-production wonder" when installed, the automatic transfer machine helped to produce the famous Kelvinator compressor. The machine performed 31 operations using 152 tools at 24 stations.

Another innovation was the adoption of the telautograph scheduling system at the main Grand Rapids plant. Common in the automobile industry, this system was a unique method in the major appliance industry. By using this communication system to transmit information throughout the plant, it was possible to produce a variety of models on the same production lines in an uninterrupted flow, to meet specific orders.

A new insulating process for evaporators was also developed. The new process eliminated the need for packing separate pads for fiber glass insulation around the evaporators by "enrobing" the evaporator with a continuous blanket of adhesive plastic foam.

As the oldest manufacturer of electric refrigerators for the home, Kelvinator lays claim to a long list of "firsts" which have contributed to the convenience and performance of refrigerators and other appliances. These "firsts" include:

First practical electric refrigerator for the home-1914.

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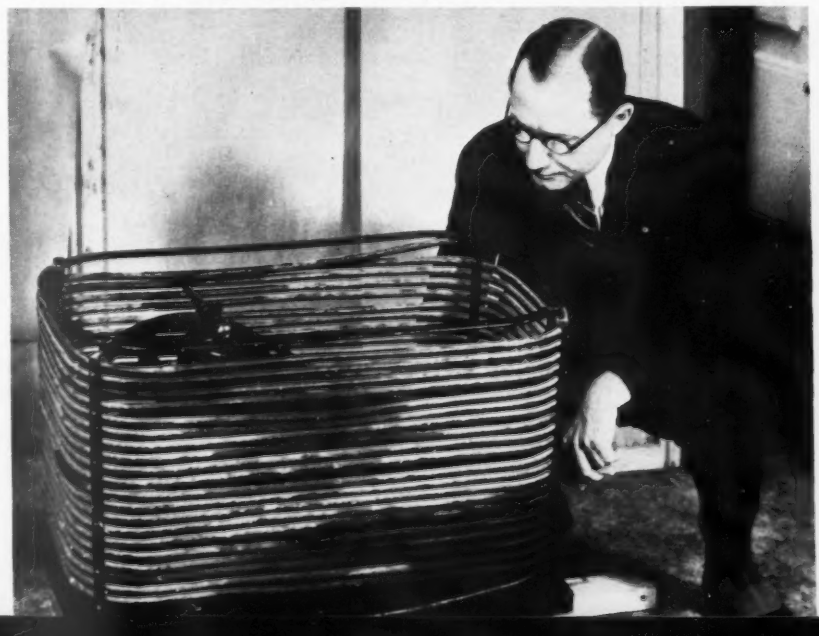
*Edmund J. Copeland, originator of electric automatic refrigeration, views his first practical model. The compressor of the refrigerating unit sets inside the cooling coils for the refrigerant, which are wound around the compressor on a wooden base, much after the appearance of an old wicker clothes basket.*



**Used in the New 1960 KELVINATOR REFRIGERATORS featured in this issue.**

**The list is growing,** and this is why:

Simmons Plastic Spring-Lock Shelf Supports are strong, attractive and low in cost. The "heart of steel" (see picture below) molded inside the plastic provides added strength. Installation is blind, quick, easy, requiring no special tools, no bolts, nuts or threadings. Just insert, give a half-turn... spring-steel legs grip panel securely.

Any shape head can be molded in any color. Even limited quantities can often be produced at negligible tooling expense because of ingenious mold designs.

Strength and flexibility of head design make Spring-Lock ideal for cover knobs, drawer pulls and similar uses, in addition to their perfect application as refrigerator shelf supports.

**Write for additional information**—40-page catalog gives complete data on Spring-Lock and other Simmons special fasteners.

# 50

## Top refrigerator makers

## now save with Spring-Lock shelf supports

**IN THE UNITED STATES**

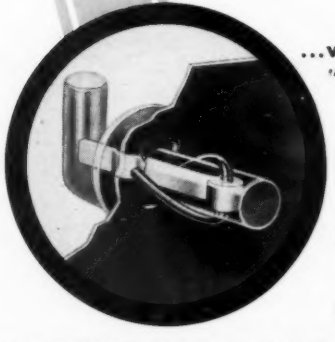
Frigidaire Div., General Motors Corp.
Philco Corporation
General Electric Company
Hotpoint Company
Admiral Corporation
Westinghouse Electric Corporation
Whirlpool Corporation
King Refrigerator Company
Glasco Corporation
Quicfrez, Incorporated
R.C.A. Whirlpool
Ranney Refrigerator Company
Ben Hur Manufacturing Company
Maytag Company
Springer Industries, Inc.
Gibson Refrigerator Co.
Buhl Mfg. Company
Franklin Mfg. Co.
Acme National Refrigeration Co.
Revco, Incorporated
Jordon Refrigerator Co.
McCray Refrigerator Co., Inc.
United Refrigerator Co., Inc.
Howard Refrigerator Co.
Norris Thermador Corporation
Foremost Commodities Mfg.
Sub-Zero Freezer Co., Inc.
Amana Refrigeration Inc.
Kelvinator Div.—American Motors Corp.
A. J. Lindemann & Hoverson Co.
Trend Refrigeration Div.
Miller Trailers, Inc.

**IN CANADA**

Frigidaire Products of Canada, Ltd
Canadian G.E. Co. Ltd.
Tudhope Specialties, Ltd.
Fleet Mfg. Co. Ltd.
Taymouth Industries, Ltd.
General Steel Wares, Ltd.
Moffats, Ltd.
Canadian Westinghouse Co. Ltd
Canadian Admiral Corp. Ltd.
E. Roy Industries Ltd.
Defrost-O-Matic Co. Ltd.
Kelvinator of Canada Ltd.
Liquid Carbonic Canadian Corp. Ltd.

**FOREIGN**

International G.E. Co. (Mexico)
Saar Brown Boveri (Germany)
La Casa Grande (Cuba)
Aktiebolaget Hakanssons Industries (Sweden)
Jaakone Oy (Finland)
E. A. Rosengrans (Sweden)



**...with the "heart of steel"**

**BE SURE TO VISIT BOOTH 2434 1960 Design Engineering Show**

# SIMMONS FASTENERS

SPRING-LOCK • LINK-LOCK • HINGE-LOCK • CLAMP-LOCK
QUICK-LOCK • DUAL-LOCK • ROTO-LOCK • HOOK-LOCK

**SIMMONS FASTENER CORPORATION**
**1768 NORTH BROADWAY, ALBANY 1, NEW YORK**

SEE OUR CONDENSED CATALOG IN SWEET'S PRODUCT DESIGN FILE

# "Consumer satisfaction first"

*A SPECIAL REPORT*

*by George Romney* • *PRESIDENT, AMERICAN MOTORS CORPORATION*

WE AT AMERICAN MOTORS HAVE TRIED to guide our operations in two great industries in accordance with the fundamental principles on which our economy is based — the principle of competition as the means of keeping ultimate economic power in the hands of the people as consumers, reward based on contribution, voluntary cooperation, and division of the fruits of economic progress among people generally.

We believe the American economy has achieved its present stage of progress because of adherence to these principles of what I prefer to call "consumerism," rather than to the misleading concept of "*capitalism*" which some have interpreted as the exploitation of the many by the few and the subordination of human considerations to money and the profit motive.

"Consumerism" means an economy controlled by the people as consumers, just as our tradition of democracy means a political system controlled by the people as citizens.

Henry Ford proved years ago that the most successful businesses are those that seek to provide consumer satisfaction first; the rewards in terms of profits will follow. Those who put profit first will lose their ability to satisfy the consumer, and having lost their ability to serve a useful economic purpose, will lose their profit-reward as well.

One way in which a company can live up to these principles of "consumerism" is to aim at a qualitative rather than a purely quantitative approach. Our Kelvinator appliance division has taken this type of approach to its dealer organization as a matter of policy for years. To stress its belief in the effectiveness of such an approach to the consumer, it has in 1960 affirmed a policy of "progressive product development," which means making a change in your product when it represents a genuine contribution to increased customer satisfaction — and not merely change for its own sake.

Progressive product improvement has had other important advocates whose success speaks for itself. Many companies on individual products have taken a similar approach in practice, but in many cases almost surreptitiously as if avoidance of economic waste were a cardinal sin in modern merchandising.

The adherence of so many in both the appliance and automotive industries to the "annual model change" theory is backed by successes too. But we believe that much of the argument supporting annual model changes has been founded on assumptions that appeared more valid than they actually were. At this time they have largely lost whatever validity they did have.

Such an assumption is that since technological progress in manufacturing has made it possible for our factories to outstrip our ability to consume, it is economically desirable to make consumers dissatisfied with what they have, in order to stimulate further production and continued economic growth.

We fully recognize that the American consumer has never been satisfied with a product or service if a better one, that she could afford, was presented to her. But the key to the proper application of this assumption is the word "better." In the competitive striving for something better, all too often something merely "different" has been offered as something "better." When the pressure for difference results in change without actual improvement, then it is time to take a look at such a wasteful philosophy.

If forced obsolescence is the economic justification for the annual model change, then in our judgment it is a false

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Many
of
Kelvinator's
finest
products
start
as
sheets
of
GREAT LAKES STEEL

*Great Lakes Steel is a Division of* **NATIONAL STEEL CORPORATION**

# "Foreign market of immense interest"

*A SPECIAL REPORT*

*by Bernard Chapman* • *EXECUTIVE VICE PRESIDENT AND GENERAL MANAGER, KELVINATOR DIVISION*

THE GREAT U.S. MARKET FOR MAJOR APPLIANCES in the 1960's has been proclaimed with much fanfare in magazines and newspapers recently with appropriate recognition for exploding populations, rising standard of living, and other economic and social changes.

As a member of the major appliance industry. Kelvinator welcomes such published forecasts and the promised new business that has been spelled out for the future of this country.

Customarily, the appliance market has been considered to be principally in the United States where people enjoy a high standard of living which has been continually improving.

However, there is a great potential market outside the borders of the United States. The worldwide market promises to become larger in terms of volume than that of this country where there is only six per cent of the world's population.

A harbinger of the steadily improving foreign appliance market was seen in 1958 when production of refrigerators throughout the world exceeded the U.S. production volume for the first time in history.

This foreign market is of immense interest to Kelvinator because we are already doing business in 141 countries around the world through Kelvinator International, Inc.

Kelvinator's entry into the foreign market place came less than 10 years after its first experiments with electrical refrigeration for the home. An American businessman in Shanghai ordered a dozen refrigerators which were shipped to him in 1923. Canadian operations began in 1924 with a distributorship — Great Britain followed two years later, and our oldest active manufacturing licensee, Kelvinator Australia, was formed in 1931.

Today there are some 300 distributors of Kelvinator or Leonard appliances from Ireland to Timbuktu. Distribution operations are supported by manufacturing licensees and subsidiaries in 18 different countries. This worldwide operation has earned for Kelvinator International one of the leading positions in the foreign market.

In the development of the foreign operations, Kelvinator's international business relationships were founded on the belief that the rewards and responsibilities in the enterprise should be shared with the countries and the people involved.

We have subsidiary manufacturing operations in Canada and Great Britain, while the rest are manufacturing licensees, who have the use of the Kelvinator name, plus

management, engineering, and manufacturing assistance.

We want the operation to be owned, at least in part, by the nationals of the country where we do business so that the financial return is shared by that country and our own. Licensee companies as well as subsidiaries are managed and staffed by nationals of the respective countries.

This international business philosophy has two major

advantages: it makes good sense from a practical business standpoint to have nationals sharing in the rewards and the management of the business; and it implements the free competitive enterprise doctrine which is the Western world's most important contribution to the economic self-development of all nations.

Everyday business relationships conducted in mutual

*to Page K-42* →

*We are proud*
*to have the privilege*
*of being an*
*important supplier*
*of appliance*
*finishes to the*
*KELVINATOR DIVISION*
*of American Motors*


**JONES - DABNEY CO.**

**Division of Devoe & Raynolds Co., Inc.**

**Detroit, Mich. • Louisville, Ky. • Newark, N. J. • Riverside, Calif.**

*PIONEERS IN THE DEVELOPMENT AND MANUFACTURE OF EPOXY RESINS*

# "Adherence to fundamentals"

*A SPECIAL REPORT*

*by Homer Travis* • *VICE PRESIDENT IN CHARGE OF SALES, KELVINATOR DIVISION*

MONTH-AFTER-MONTH LAST YEAR, Kelvinator maintained a sales pace that kept it well ahead of the industry. The year culminated with Kelvinator's dealer billings up more than 30 per cent over the previous year, and three times the industry's 9.5 per cent average increase for ten major products.

How was this significant improvement accomplished during a year that was often a question mark in the minds of businessmen, a year in which predictions for the general economy varied up or down according to the forecaster and the period of the year, and a year in which the threat of a steel strike and the strike itself prevailed during the second half?

At Kelvinator, we believe it was adherence to fundamentals of sound manufacturing and merchandising that kept our sales ahead of the industry throughout the year.

We started the year reaffirming our belief that consumers wanted appliances that provided basic benefits without complicated gadgets and frills. This product philosophy ultimately resulted in the formulation of our "progressive product development" program which was announced in January of this year, and which promises model changes as soon as they are ready instead of only on an annual basis.

We strengthened our field organization, revitalized our historic franchise principle for dealers, adopted a new approach to advertise our products and our product philosophy, and tightened control over product quality.

To continue to assist our dealer organization with the fundamentals of sound business and merchandising principles, we provided intensive training programs for our field organization. District managers were drilled in sound retail business practices, creative selling and merchandising, proper evaluation and reconditioning of trade-ins, and many other skills that they provide to service their dealers.

We restated the long-standing Kelvinator philosophy of retail-mindedness: "An adequate dealer for every market, and an adequate market for every dealer."

As the result of these long-range programs in union with seasonal promotions, our list of active dealers who met a minimum standard of unit sales and merchandising activities increased by 52 per cent over 1958. This improvement points up the importance of another aspect of Kelvinator's retail-mindedness: we can only go as far as our dealers carry us.

Our new look in advertising actually began in the summer of 1958 when we ran a highly successful magazine advertisement that asked the question: "Confused by claims for automatic washers? Thousands of women are." This editorial-type ad was an outstanding success — so much of a success, in fact, that it led us to produce a whole series of ads along similar lines, and to produce a free booklet to help consumers make their appliance purchases wisely. Subsequent advertisements in magazines and newspapers headlined: "Do You Want More Complicated Or More Useful Appliances?" "Some People Claim 'You Can't Sell Quality Any More.'"

These advertisements in national magazines and daily newspapers spoke frankly about what the manufacturer should design and engineer into his products to provide basic consumer benefits, as distinguished from gadgets and frills. Surveys proved that this kind of advertising was unusually effective in terms of credibility and retention.

With the consolidation of our manufacturing at Grand Rapids (from Peoria and Detroit), Kelvinator achieved important cost savings by reduction of overhead and the elimination of inter-plant handling costs.

Sales so far this year are continuing at a pace well ahead of last year. While it is possible that the industry will not achieve a gain of any significance over 1959, Kelvinator should score an important increase once again. Through 46 years of experience in this business, we will continue to work for significant improvements and make meaningful our statement: Built Better to Serve Better.

*The 41-inch foodkeeper can be installed flush-to-the-wall as a free-standing model. Exterior styling includes a vertical strip on both freezer and refrigerator door. Doors seal tightly with magnetic door gaskets. Exterior is available in white, pink, yellow, turquoise, and copper.*

# DESIGN ENGINEERING

## . . . the Foodarama 1960

THE FOODARAMA, a unique foodkeeper that combines a frostless vertical freezer with an automatic defrosting refrigerator, was introduced in 1954 by Kelvinator to offer American families a fresh choice in home refrigeration that included the "most of the best" combined with a new design concept.

The first Foodarama was a 16-cubic-foot model with rounded corners consisting of a 166-pound freezer and an 11.2-cubic foot, automatically defrosted refrigerator. Both were mounted side by side, instead of one over the other, in a single cabinet 47¾ inches wide and 60 inches tall.

It was introduced as a top-price, top-of-the-line product whose primary appeal would be to above average income families with large kitchens. Consumer response and surveys indicated that many homemakers with average income and average size kitchens were able to buy it. They welcomed the huge capacity, the unique side-by-side design, and other new storage features.

While many of these families were able to place the four-foot Foodarama in their kitchens without remodeling, a greatly increased volume was apparent if the foodkeeper could be reduced in width to fit more kitchens.

**Redesigned in 1957 to reduce space requirements**

The Foodarama was redesigned in 1957 to a taller, slimmer, square-cut shape, while retaining the side-by-side freezer-refrigerator arrangement and increasing its capacity. It now measures 41 inches wide, 63 inches high and 26⅝ inches deep, including door handles.

It combines the qualities of a bread-and-butter model and a deluxe, prestige refrigerator-freezer. It serves importantly as a dealer traffic builder and as a valuable advertising asset.

Today's Foodarama, Model K89M, has a capacity of 17.2 cubic feet, including an 11.7-cubic foot fresh food compartment and an upright freezer of 193-pound capacity. The new No Frost model prevents the accumulation of frost in the freezer and its contents, and the fresh food compartment is automatically defrosted. It is available with a manually defrosted freezer, and also in four exterior colors: pink, yellow, turquoise, and copper.

Because it has forced-convection, the unit may be installed built-in or free standing. The 41-inch width takes only as much kitchen floor space as many ranges. Doors open with the cabinet width at 90-degree angles.

Popular in many parts of the world, the dual unit has been used on safari in Africa, exhibited in international trade fairs of the U. S. government, carried by float in parades, installed in mobile homes, and placed in the palaces of ruling families in foreign countries. In at least one instance it has been used as a "status symbol" by a wealthy merchant in a house without electricity, where it served as a conversation piece.

Design and feature highlights of the 1960 model include: Constant circulation of cold air in both freezer and fresh food compartment that cools food faster, insures more uniform temperatures, and banishes frost. Cold Mist Crisper in the fresh food compartment for balanced humidity storage of produce. Package Pantry for storing prepackaged fruits and vegetables. Perimeter Sealing by magnetic door gasket.

EXCLUSIVE MPM PHOTO

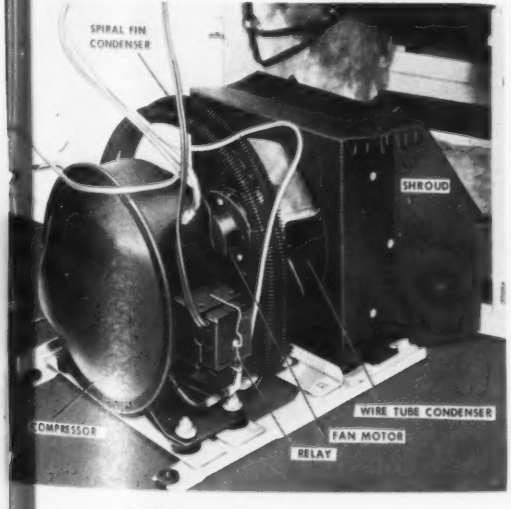
*L. D. Thompson, manager of industrial engineering, explains the Kelvinator "Compact" hermetically sealed compressor. This is a demonstration unit with plexiglass exterior to show moving parts.*

In addition, an automatic ice dispenser which makes ice "crescents" without trays and stores them in a special container is available as a factory installed built-in accessory.

**Refrigeration system**

The No Frost model operates on the principle that moisture or frost transfer to the coldest surfaces, such as the evaporator plate in the provision compartment, or the evaporator coil in the freezer compartment. Both compart-

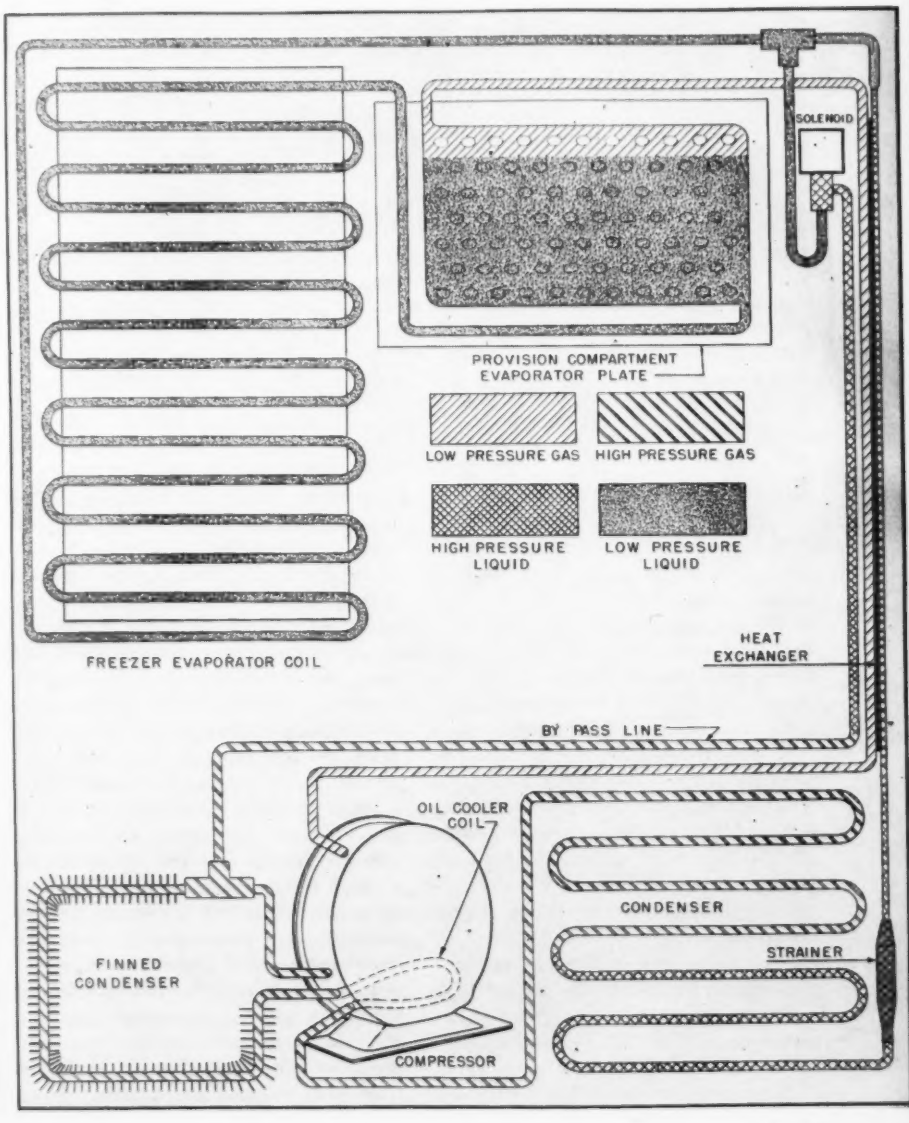
*Components of Foodarama compressor.*




## REFRIGERANT CYCLE "NO-FROST" FOODARAMA MODEL 89M

The Kelvinator "No Frost" system not only uses the ability of refrigerant gas to absorb heat to cool the refrigerator and maintain freezing temperatures, it also uses the heat-giving ability of gas to dissipate frost. The operation of the system is as follows:

From COMPRESSOR, HIGH PRESSURE GAS is changed to a HIGH PRESSURE LIQUID in the CONDENSER. This liquid refrigerant is reduced to LOW PRESSURE LIQUID by forcing through capillary tube portion of HEAT EXCHANGER. LOW PRESSURE LIQUID then passes through FREEZER EVAPORATOR COIL where it absorbs heat, and passes into PROVISION COMPARTMENT (or fresh food compartment) EVAPORATOR PLATE. LOW PRESSURE LIQUID absorbs heat in PROVISION COMPARTMENT through plate and begins to change to LOW PRESSURE GAS. Gas is returned to COMPRESSOR to repeat refrigerating cycle. At a set time each day, a timer actuates the SOLENOID COIL which opens the solenoid valve, and hot gas is forced through freezer coils, melting frost. When frost is completely melted, a thermal element closes the solenoid valve and restores the system to a cooling cycle. Water formed by melted frost runs through tube to bottom of refrigerator where it is evaporated.



*Cold Mist Crisper in the fresh food compartment of the Foodarama maintains freshness of produce in vapor-tight chamber that is surrounded by moving blanket of cold air. Two removable aluminum trays are handy for taking to kitchen sink for selection of vegetables, or when loading after shopping. Three cabinet shelves in fresh food compartment slide out, and two may be raised or lowered to accommodate items of varying heights. Porcelain-finished drawer in middle holds meats and other short-term storage items. Total capacity of Foodarama is approximately 18-cubic-feet, with six-cubic-foot vertical freezer.*

ments have forced-air cooling to maintain uniform cabinet temperatures.

The provision compartment is refrigerated by a small, compact cold plate concealed behind a decorative aluminum cover plate at the top of the back wall, behind the Cold Mist Crisper. Refrigerant circulated by a ¼-hp. compressor maintains the temperatures.

Air is drawn through a grille opening at the top of the cover plate, cooled as it is forced across the cooling plate, and then exhausted at the bottom of the baffle. A fractional horsepower motor with a 4-inch propeller-type fan constantly circulates the cool air throughout the compartment. When the door is opened, the fan stops to prevent discharging cold air into the room.

Temperature control has a fixed "cut-in" setting between 35° and 39° F. to assure defrosting of the provision compartment evaporator plate each cycle.

A separate air circulation system and concealed cooling coil maintains a freezing temperature in the freezer compartment and prevents the formation of frost on food packages, shelves, and freezer walls. The evaporator coil extends nearly the full length of the freezer compartment and is attached to the right or inside wall of the compartment and covered with a decorative aluminum plate similar to that in the provision compartment.

The freezer air system is the reverse of the provision compartment. Air is drawn in at the bottom of the baffle over the freezer coil and exhausted out through the top grille opening. The 4½-inch air circulating fan in the freezer compartment operates only when the door is closed and when the compressor is running. During the hot gas defrost period, however, the circulating fan does not operate, although the compressor is running. The automatic defrost control opens the electrical circuit to the fan motor during the defrost period.

All air circulating fan motors are encased in housings and mounted in neoprene grommets. Each fan motor is designed for its own application, and they are not interchangable. The lubricant in the provision compartment fan motor is suitable for 30° F., while the freezer compartment fan motor has a lubricant suitable for 0° F.

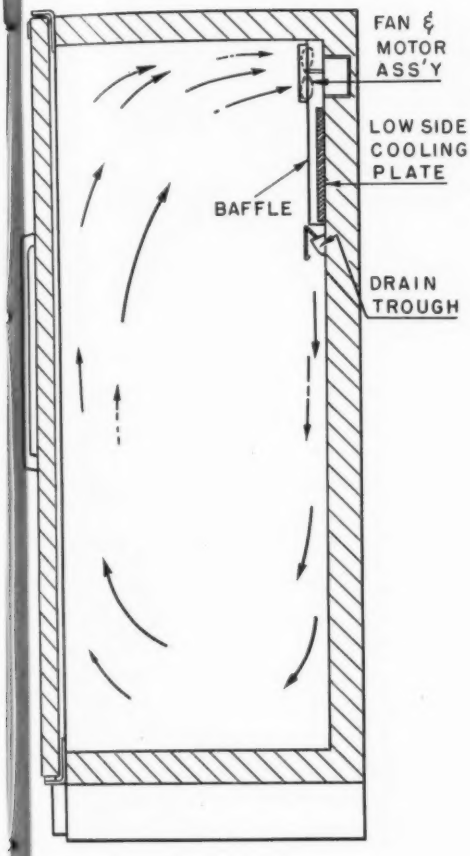
**Refrigerant cycles**

A small diameter tube is used as the liquid line. The characteristics of this tube eliminate the need for any other form of liquid control to the low-side evaporators.

Refrigerant vapor is compressed and discharged into the condenser where it is liquefied. It then flows through a strainer to the small diameter liquid line, through which it passes with gradually decreasing pressure until it reaches the line at the entrance to the freezer-evaporator coil. A finned tube coil is used as the freezer-evaporator. Expansion and evaporation start in the freezer-evaporator. The refrigerant then flows to the evaporator plate in the provision compartment.

The vaporized gas in the top of the provision compartment plate is drawn back to the compressor through the suction line, to which the liquid line is soldered in heat exchange relationship. The comparatively cool suction vapor

*Freezer coils permit refrigerant to absorb heat from freezer compartment. Coils are nearly the full depth of freezer and about two-thirds of compartment height. Coils are concealed by decorative aluminum cover plate, and fan blades are covered by wire guard. Trough below collects defrost water.*




*(Left) — Cross-sectional view of provision compartment showing air circulation.*

*(Right) — Freezer air system is reverse of provision compartment. Air is drawn in at bottom of the baffle over freezer coil and exhausted through top grille opening. Fan circulates air only when door is closed and when compressor is running.*

absorbs some of the heat from the liquid passing through the liquid line, thus sub-cooling the liquid and increasing the efficiency of the system.

A spiral fin condenser in the discharge line ahead of the wiretube condenser is connected in series with the oil cooler coil in the compressor shell. The hot compressed refrigerant vapor passes first through the spiral fin condenser, then back into the oil cooler coil in the compressor shell where additional heat is picked up from the oil, and then into the wiretube condenser.

The provision compartment evaporator plate defrosts automatically on each cycle.

The provision compartment defrost water is caught in a plastic trough directly below the evaporator plate. A spout on the plastic trough extends through the liner, where a plastic drain tube is attached to the spout. The defrost water is funneled through the drain tube and down into a water evaporating pan in the machine compartment.

The provision compartment defrosts automatically each cycle, and the freezer compartment is defrosted daily.

The method of defrosting the freezer compartment evaporator coil is a unique adaptation of the hot-gas method of defrosting. It requires compressor operation. Hot compressed gas leaving the compressor is bypassed around the condenser and small diameter liquid line, into the freezer-evaporator coil. The latent heat (and some sensible heat) contained in the gas is absorbed by the evaporator coil and the gas is condensed to a liquid. The heat which is absorbed melts the frost. The liquid then flows from the freezer-evaporator coil to the provision compartment evaporator plate.

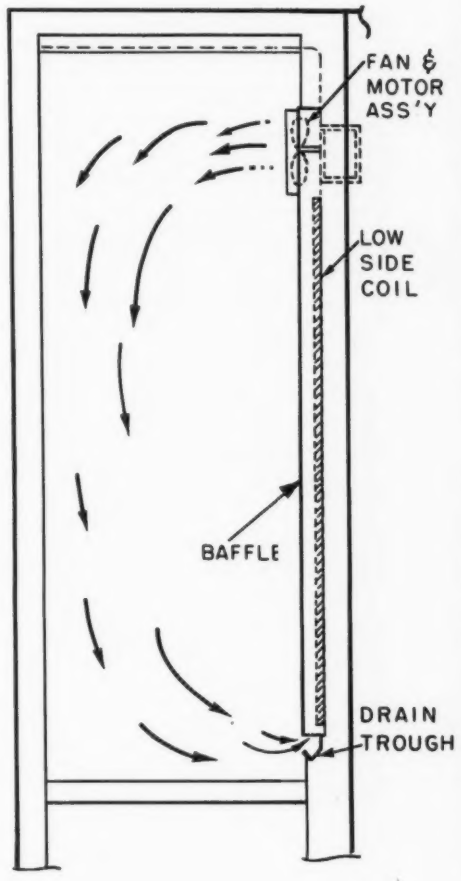
The refrigerant (liquid and vapor) is drawn back through the suction line to the compressor dome. The liquid absorbs heat from the hot motor-compressor assembly and vaporizes. The vapor is drawn in by the compressor pump and the cycle is then repeated.

A 3/16-inch copper line bypasses the condenser and small diameter liquid line. In this bypass line, and mounted back of the freezer compartment, is an electric solenoid valve of the normally-closed type which is actuated by the automatic defrost control. Closing of the electrical contacts in the defrost control energizes the solenoid valve. This opens the bypass line, and since it offers less resistance to the flow of refrigerant than the small diameter liquid line (capillary tube), there is an immediate rush (due to pressure difference) of compressed gas through the bypass line into the freezer-evaporator coil.

The suction pressure will rise in accordance with the evaporator plate temperature during the defrost period. The compressor dome temperature will drop to approximately 25° to 40° F. above room temperature.

When the defrost control thermal bulb in the freezer well reaches approximately 42° F., this temperature-sensitive element opens the electrical contacts to close the solenoid valve.

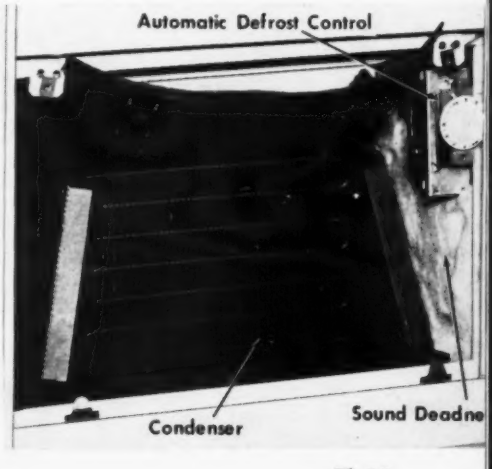
The compressor continues operating to lower the freezer and provision compartment evaporator temperatures to the normal operating range. It then cycles to maintain normal storage temperatures in the refrigerator.



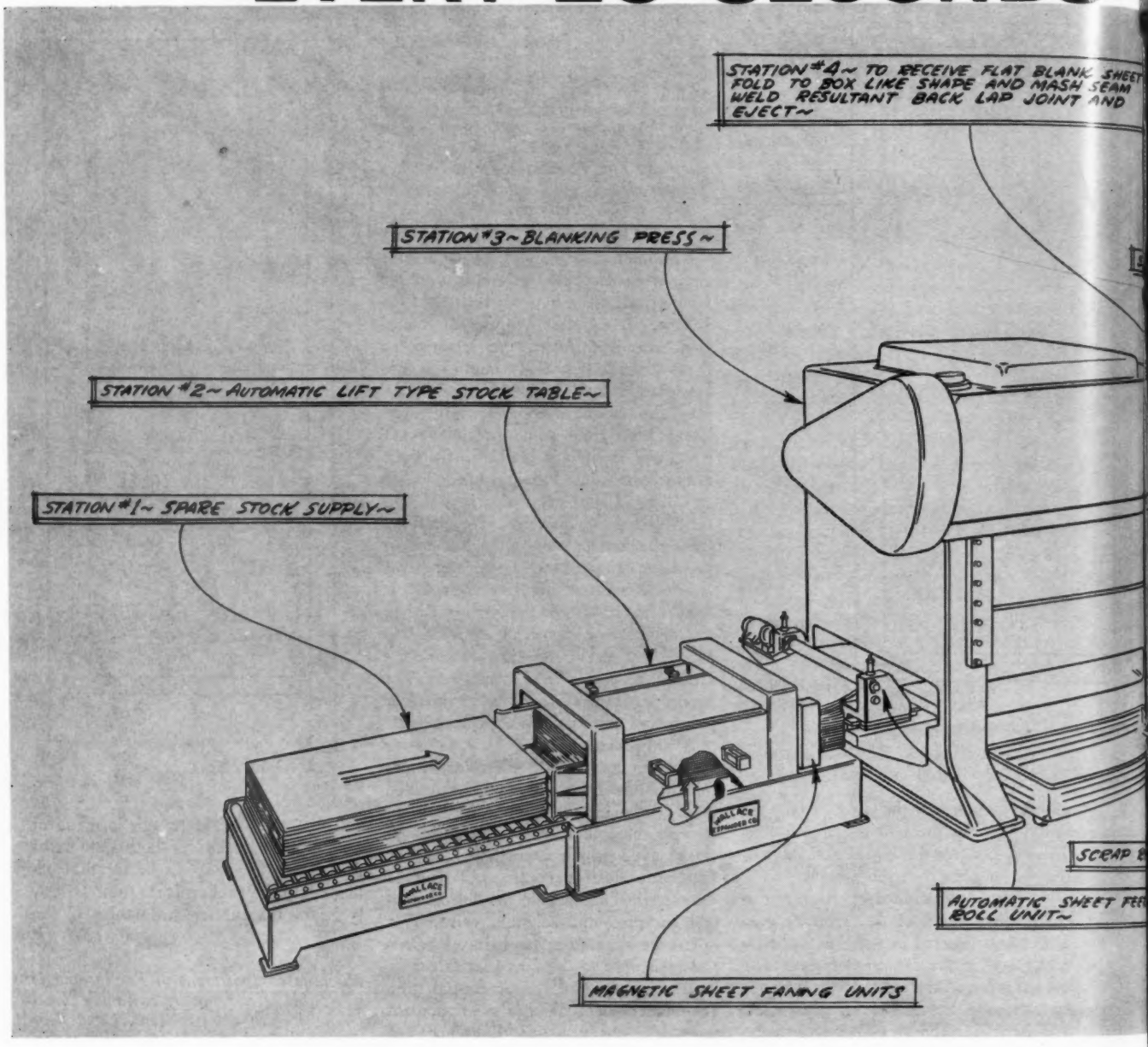

The freezer drain trough is made of aluminum. Attached to the underside of the trough is a 25-watt heater that extends into the rubber drain tube. Directly below the rubber drain tube, in the

*to Page K-24* →

*Machine compartment of Foodarama is accessible from front by removing panel below freezer compartment. Condensor can be cleaned and adjustments made in automatic defrost control.*



# EVERY 20 SECONDS




## THIS WALLACE EXPANDER LINE MAKES A FULLY-FORMED APPLIANCE CABINET FROM SHEET OR COIL! AUTOMATICALLY!

*Imagine the savings in machine time and man hours!* Coupled with either coil feed or sheet loading unit, blanking press, quad-fold and seam-weld unit, special blank and pierce units, a Wallace Expander increases production many fold—and with less man power!

*Eliminates costly die-changing time* by using one basic set of dies with internal modifications to produce several different models of a basic cabinet design (without mechanical change-over)—*even during normal running speed of line! No down time!*

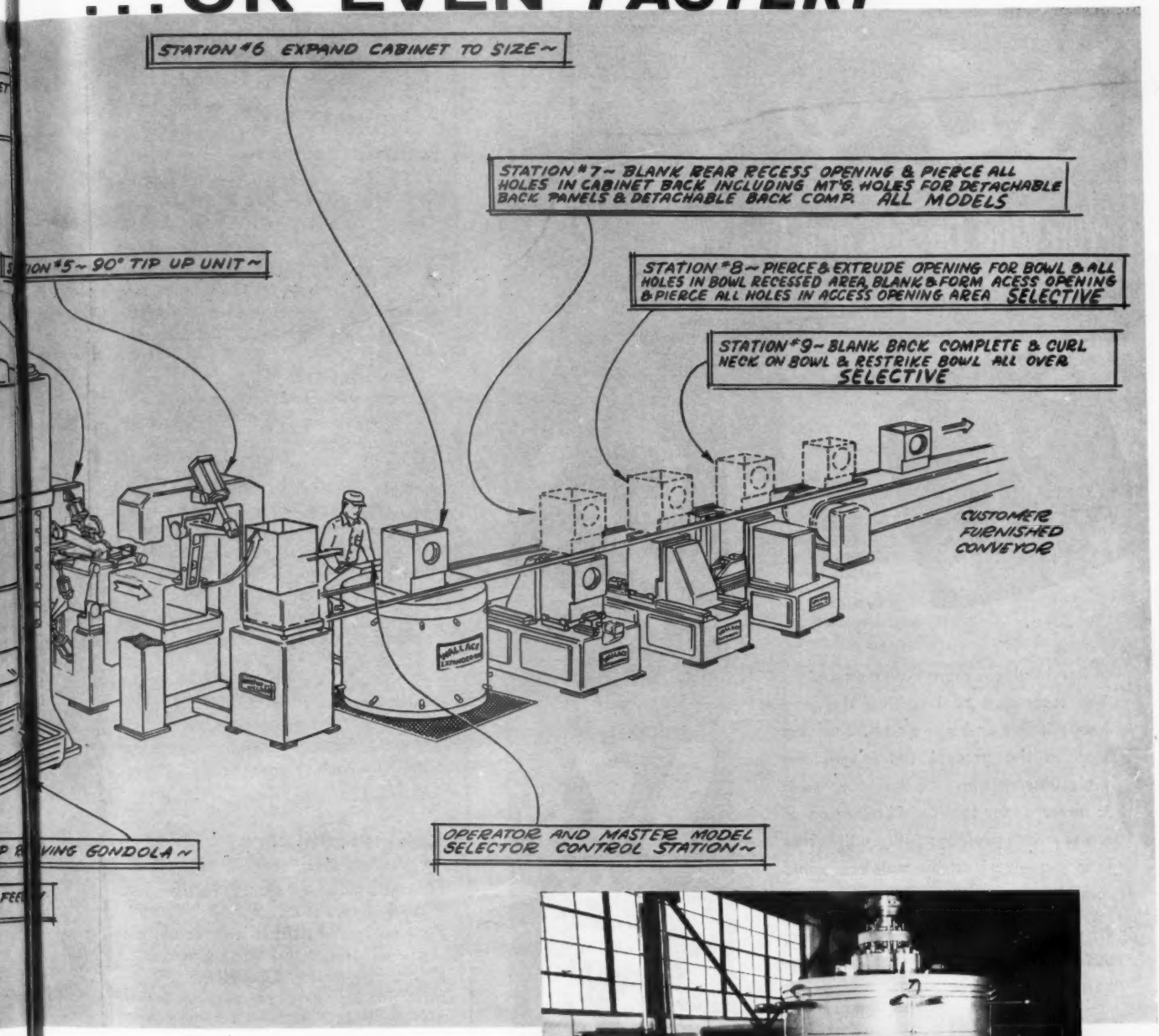
**A WALLACE EXPANDER FORMS A WELDED CYLINDER INTO...** *A SQUARE*

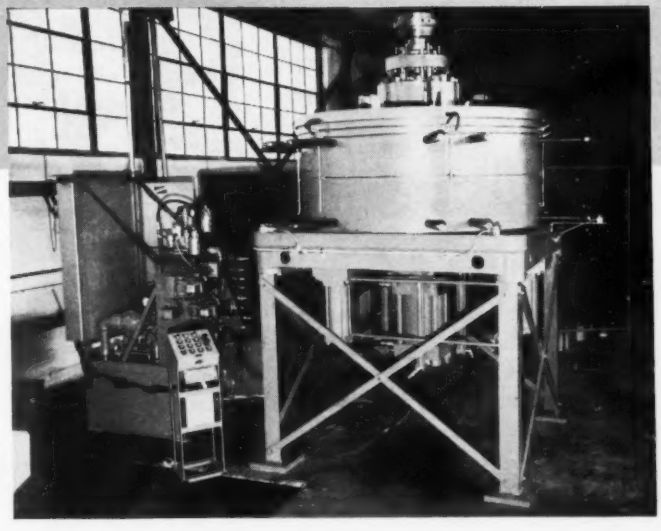
*RECTANGULAR*

*OR ROUND SHAPE*

Explain your requirements to Wallace today by phone. No obligation of course.

# ...OR EVEN *FASTER!*



**Saves up to 30 man-operations**
**Rugged • Dependable • Flexible**

The Wallace Expander—at operator's instructions—selects proper die arrangement for preformed blank . . . hydraulically forms it to exacting specifications.

**EXPANDER AVAILABLE AS SINGLE UNIT**

**WALLACE**

**TOOL AND DIE CO., INC.**
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**EXPANDING MACHINES, INC.**
1100 E. Maryland St., Indianapolis, Ind. ME 2-6405

Alvie T. Wallace, *President*
Ralph E. Roper, Gen. Mgr.

*CUSTOM ENGINEERED EXPANDERS, FORMING AND FABRICATING EQUIPMENT FOR INDUSTRY*


PRESSWORK INCORPORATED
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Detroit 4, Michigan
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machine compartment, is a plastic trap held to the top of the compartment by a spring clip. A small amount of water remains in the trap to prevent warm humid air from entering the freezer compartment.

**Automatic ice dispenser**

The automatic ice maker and dispenser is a factory-installed built-in accessory on the 1960 Foodarama. Connected to the cold water line in the home, the compartment is located in the upper left corner of the freezer compartment. A decorative front cover plate encloses and protects the operating mechanism.

The aluminum die-cast ice mold is automatically filled with water. The ice mold has a semi-circular interior partitioned into equal compartments. Water enters at one end of the mold, and openings in the partitions permit all compartments to fill.

The mold heater, rated at 300 watts, melts the ice contact surface in the mold allowing ejection of the ice pieces. The heater is covered with an aluminum sheath and is embedded in a grooved section in the bottom of the mold.

Molded aluminum ejector blades extend from a central shaft. Each blade, sweeping from a central shaft, ejects a section of ice from the mold. A cam-driven signal arm operates an electric switch to control quantity of ice produced.

## Kelvinator history

→ *from Page K-11*

First self-contained electric refrigerator, the Kelvinet-1925.

First automatic defrost without the use of added electrical heating elements.

First across-the-top food chest-1939.

First full-length, top-to-bottom refrigerator-1948.

First foodkeeper to provide an upright food freezer separately insulated and refrigerated side-by-side in the same cabinet with an automatically-defrosted fresh food compartment — The Foodarama-1954.

First range to provide disposable aluminum foil oven linings-1954.

With dynamic George Romney, chairman and president of American Motors, holding the spotlight in the American press in connection with automatic developments, it might be expected that such publicity would overshadow the parallel forward march of Kelvinator Appliance Division.

Nevertheless, under the direction of Bernard A. Chapman, executive vice

*to Page K-41* →

*Roll former for flanging the refrigerator outer cabinet blank.*

THE OUTSTANDING EXAMPLE of modern fabricating equipment in the Kelvinator plant is the automated line for forming and welding refrigerator cabinets. Kelvinator engineers call it the "shell automation machine."

The general policy on fabricating facilities is to use standardized equipment wherever possible in order to have versatility to meet changing product requirements. The big exception to this policy is the refrigerator cabinet line, which has the sole function of forming and welding refrigerator cabinets. The flexibility of this equipment lies in its ability to process cabinets in all varieties of heights and widths.

The 26-station forming and welding line is close to 170 feet long and is controlled by approximately 20 miles of wiring. Five cabinet sizes for Kelvinator refrigerators can be formed and welded, although no single model requires the use of all 26 stations.

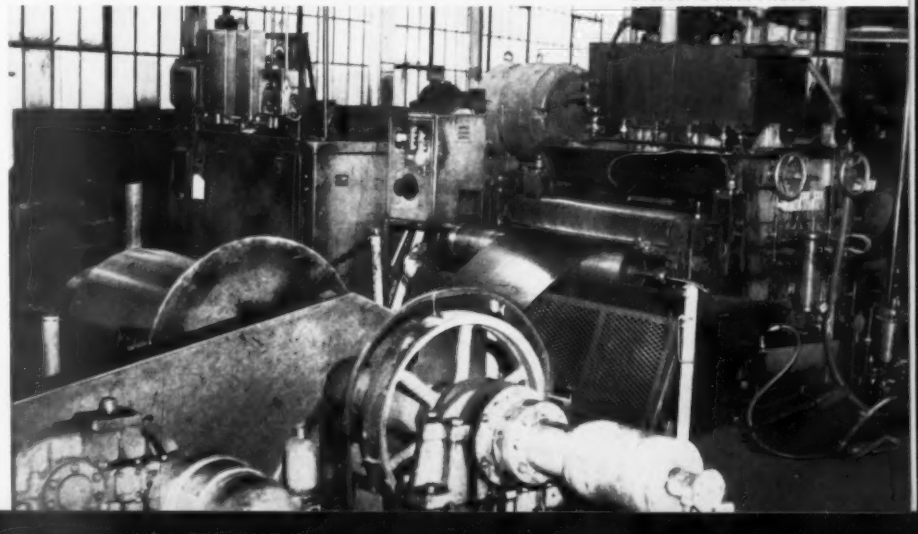
The operations preceding the automatic welding and forming line include slitting and shearing the coiled, 30½-inch steel; piercing the cabinet blank on a 90-ton press; and roll forming the flanges. The station-by-station procedure is as follows: (1) sheets are loaded at an outboard loading station; (2) liner support is welded to flat sheet; (3) sheet is U-formed and seam welded; (4) back panel assembly is loaded and welded; (5) an idle station provides room for tool clearance; (6) two upper corners of cabinet are cold metal finished; (7) cross rail is welded to cabinet (one model only); (8) inside roll of pilaster and two support barriers are spot welded (also one model only); (9) idle station; (10) corner gussets are welded; (11) idle station; (12) upper cross rail assembly is positioned; (13) idle station; (14) bottom cross rail is positioned; (15) two spot welds are made at both ends of the cross rails at inner flange of pilaster; (16) shell bottom pan is loaded and welded; (17) idle station; (18) back panel is welded to leg reinforcements and two bottom corner gussets are welded (on three models); (19) bottom panel is welded to side of cabinet shell; (20) two corner gussets are loaded and welded (one model); (21) front and rear support assemblies are loaded and welded; (22) front support assembly is spot welded to the inner flange of the shell and two frame supports are inserted (one model only); (23) two ends of wrapper are flanged; (24) front and rear support assemblies are spot welded to bottom flange of shell; (25) hinge reinforcements are welded; (26) completed shell is turned 180° and placed on a delivery conveyor.

### Fabricating crisper pans

Another excellent example of Kelvinator fabricating is the eight-press forming line for crisper pans used in the refrigerator-freezers. The crisper blank is drawn in the first press, a hydraulic, 1000-ton model. The drawn shell moves down a gravity conveyor to a 250-ton, mechanical-crank press, which trims two

*Slitting and shearing equipment for refrigerator cabinet blanks. The 20-gauge steel is 30½ inches wide. In foreground are the uncoiler and stretcher leveler.*

EXCLUSIVE MPM PHOTO



# Chicago Vitreous frits

# with *Kelvinator*

# go hand in hand
# APPLIANCES

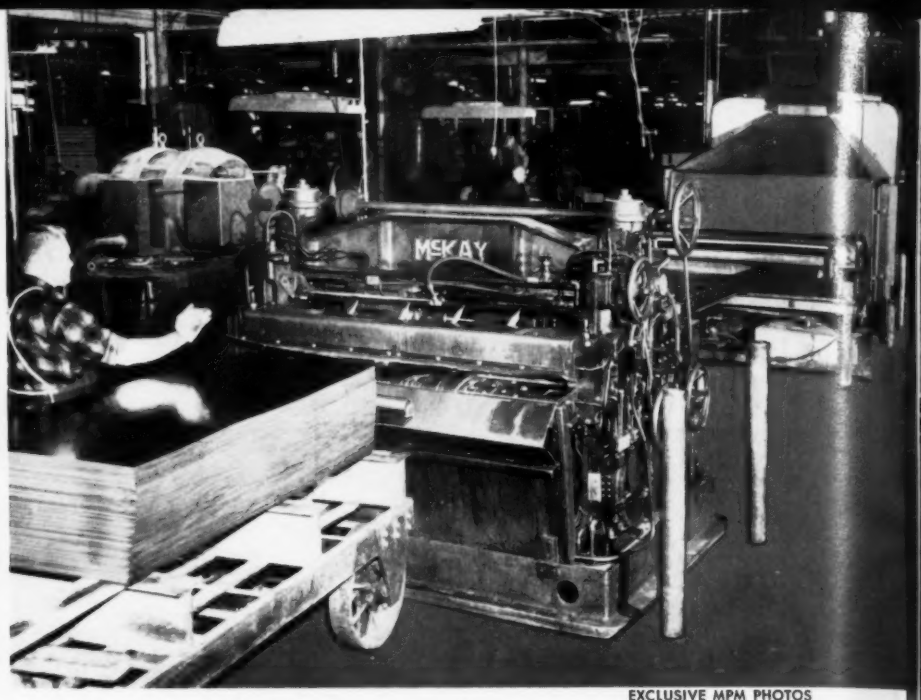
**For over 40 years Chicago Vitreous Corporation has manufactured porcelain enamel frits to protect and beautify products of all types. Over these decades Chicago Vitreous has come to be known as a major supplier to the appliance industry, large and small manufacturers alike. We're proud to enjoy the confidence and respect of the nation's leading appliance manufacturers and pleased to number Kelvinator among them. To Kelvinator and the entire appliance industry we look to the future with a steadfast determination to continue our role of the past 40 years—a partner to progress in porcelain enamel.**

A DIVISION OF THE EAGLE-PICHER COMPANY

Chicago Vitreous **CORPORATION**

1425 SOUTH 55TH COURT • CICERO 50, ILLINOIS

*Special-purpose welder for welding fittings and brackets on compressor shells has 14 welding stations. Specific station combinations can be selected to handle part variations. Fixtures rotate as the dial indexes and slot bolts position the fixtures at the welding stations.*




EXCLUSIVE MPM PHOTOS

*Operator at left feeds blanked sheets for Foodarama provision compartment door into stretcher-leveler which, in turn, feeds gravity roller conveyor to dry drawing compound roller applicator. This is followed by a steam-electric oven for drying the "dry lubricant."*

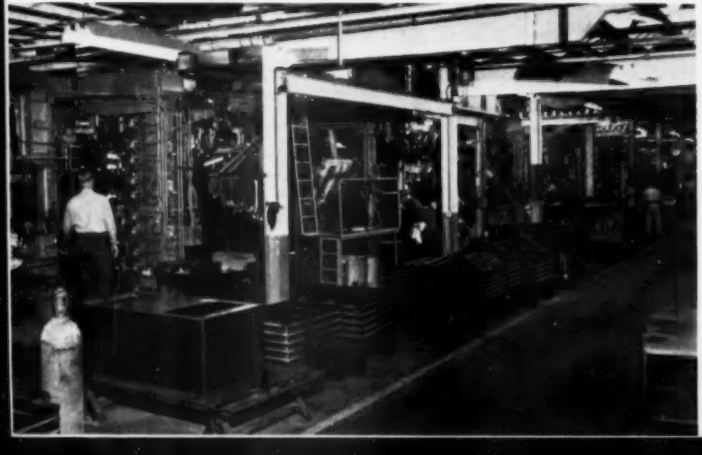
sides so the piece will fit the expanding die. The piece then proceeds to a similar press where the sides of the crisper are expanded. The fourth press gives the crisper pan an all-round trim, and the fifth press performs a cutoff and front flange forming operation. The sixth press pierces two hanger holes for hanging in the porcelain enameling furnace and adds two embosses which act as a tray stop. Presses five and six are 110-ton, single-crank types. The pan moves to a 60-ton, single-crank press, which pierces a combination drain hole-hang hole on the front side, and the last press pierces drain holes on the front side of the crisper.

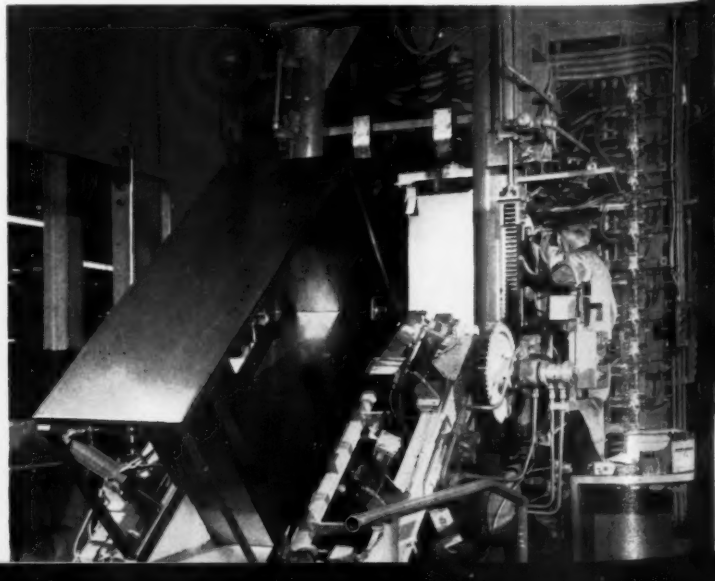
Also a major item of fabrication in the refrigeration department is the provision compartment door on the Foodarama refrigerator-freezer. Blanked sheets are fed into a stretcher-leveler which, in turn, feeds a gravity roller conveyor to a dry drawing compound roller applicator. This is followed by a steam-electric oven for drying the "dry lubricant." The blanked sheets are then processed by a series of six presses. The sheet is drawn in the first press, a 200-ton toggle type. The second press, a 100-ton toggle type, is equipped with a corner trim die. The third press, a 100-ton double crank, performs an all-round piercing operation. The door is face pierced in a 75-ton double crank press, the side flange is formed in a 70-ton press of similar design, and the end flanging is accomplished in the final press, a 30-ton double crank type.

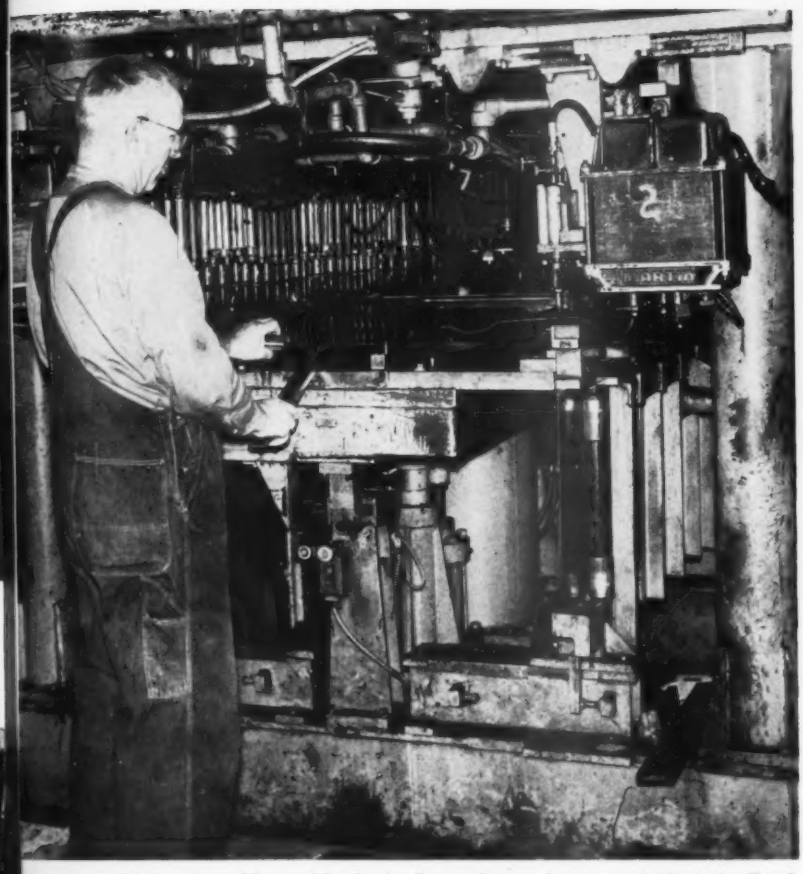
MPM PHOTO

*Dana Chase,* MPM *editor and publisher, interviews Kelvinator Works Manager George H. Beld on the company's fabricating facilities.*

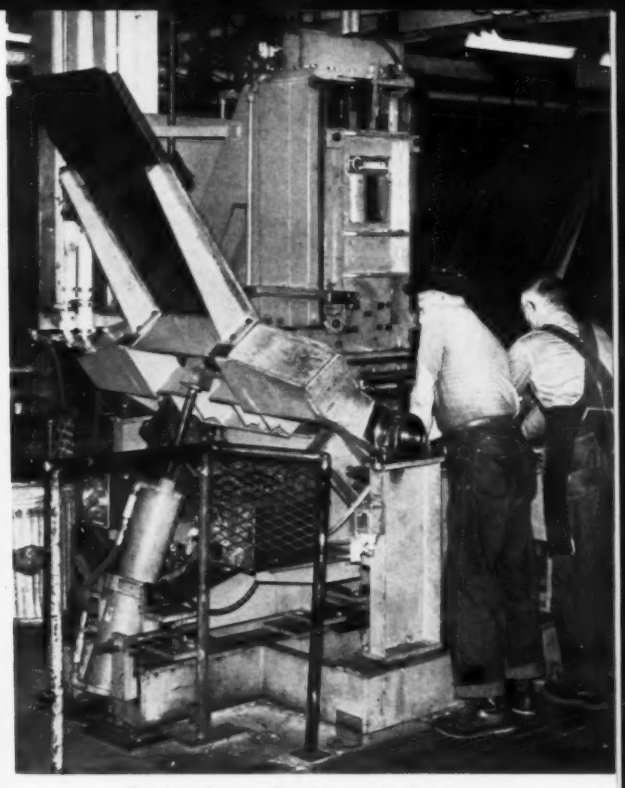
*(Below) — General view of "shell automation machine" for refrigerator cabinets. Exit end of machine is at left. (Right) — Last station in automatic cabinet forming and welding line. Cabinet has been completely welded and is being turned 180° to be placed on the delivery conveyor.*







*Automatic welder welds the back panel into the outer shell of the Foodarama cabinet.*

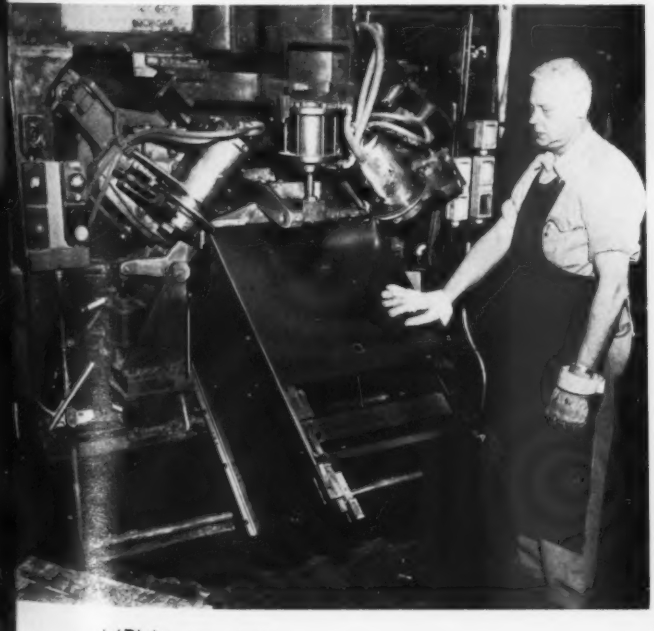


*Bender forms U-shaped Foodarama cabinet.*

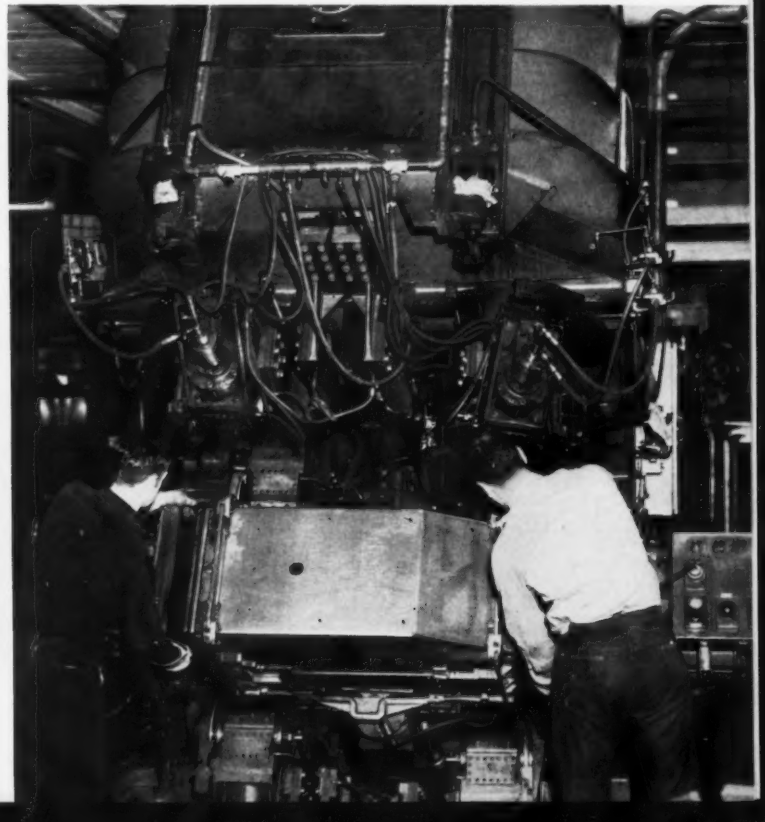
**see next page for photos of expander operations**

EXCLUSIVE MPM PHOTOS

*(Below) — Two-wheel seam welder makes diagonal weld on refrigerator liner skirt bottom.*



*(Below) — Six-wheel seam welder in process of welding top and bottom panels to refrigerator liner skirt bottom.*



# Expanding operations at Kelvinator

*Vertical seam welder on washing machine outer tub.*

*Loading outer tub into hydraulic operated expanding machine.*

*Unloading expanding machine after completion of operation.*

*Hydro piercing holes for water spout and safety release assembly.*

*Spot welding rim to outer tub of automatic washer with 4-spot indexing welder.*

# ASSEMBLY

KELVINATOR'S SMOOTHLY RUN assembly facilities include two main lines: home laundry and refrigerator-freezers.

A scheduling system that is common in automobile plants but unique in appliance manufacturing is partly responsible for the efficient operation of the refrigerator-freezer assembly department. An operator at the start of the main assembly line writes a coded description of each refrigerator on a "telautograph" machine which automatically transmits the information to parts supply areas. At the right time, correct parts for each refrigerator model are delivered to the line for installation, making it possible to produce different models consecutively to meet specific orders.

With the use of this system, completed refrigerators can be moved directly into boxcars or trucks, in accordance with day-to-day schedules, without extra handling in and out of storage.

*Merry-go-round assembly table (right) and test facilities (left) for automatic washer damper sub-assembly.*

EXCLUSIVE MPM PHOTOS

*First stages of automatic washer assembly, including motor mounting and attachment of tub, damper, pulley belts, and other parts.*

*Installation of motors and outer tubs.*

*After inner and outer tubs have been installed, the unit is filled with water and checked for leaks.*

*Outer housing is set in place and bolted to frame.*

This technique of parts scheduling is not employed on the home laundry assembly line, but in no way impairs the efficiency of the line. The two lines run parallel, but the work flows in opposite directions. When the dryer assembly and inspection is completed, the units join the washer line for touch-up painting and packaging.

Located close to the washer assembly line are the motor clutch and damper assembly and test area and the base assembly facilities, where holes for the leveling adjustment and glider assembly are reamed and tapped, and the equalizer and cage nuts are installed. The base sub-assembly is then placed

*Attaching cover, including control panel. Wiring is also connected at this point.*

EXCLUSIVE MPM PHOTOS

*Washer is connected to power supply prior to inspection and operational check.*

*Laundry Equipment Technician Charles Bielecki reads gauge during Kelvinator "product quality" test. Packaged washers are removed from shipping line at random and subjected to a complete operational test. This procedure supplements the normal inspection routine.*

*Beginning of automatic clothes dryer assembly line.*

on the moving conveyor, and assembly of the unit begins.

As the base moves down the line, the

*to Page K-44* →

**more assembly photos on next page** →

*After exterior housing and preliminary framework has been assembled, the dryer drum is installed.*


*Here's how*

# KELVINATOR

## UTILIZES WIRE AND TUBE CONDENSERS..

Kelvinator has proven the efficiency and economy of wire and tube condensers over the past two years of production. From its suppliers, Kelvinator demands reliability of product, prompt and enthusiastic service of its account and dependable delivery. Wall Tube and Metal Products Co. has been a principal supplier of wire and tube components to the Kelvinator assembly lines for this period . . . a dramatic reason for you to consider Wall Tube refrigeration components.

WALL TUBE AND METAL PRODUCTS CO.

**WALL TUBE**
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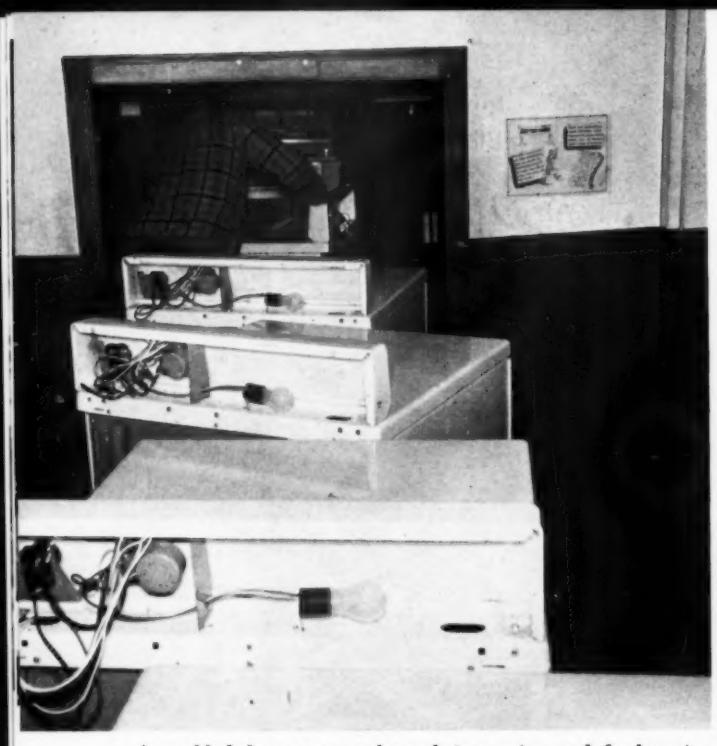
NEWPORT, TENNESSEE



*Assembled dryers move through inspection and final testing room before joining automatic washer line for touch-up painting, packaging, and final visual inspection.*

*Finished and inspected dryer is moved into position on washer line for touch-up painting and packaging.*

EXCLUSIVE MPM PHOTOS

*Sending end of "telautograph" system. Operator at beginning of refrigerator assembly line sends coded description of each refrigerator to parts supply areas. At the right time, correct parts for each refrigerator are delivered to the line for installation.*

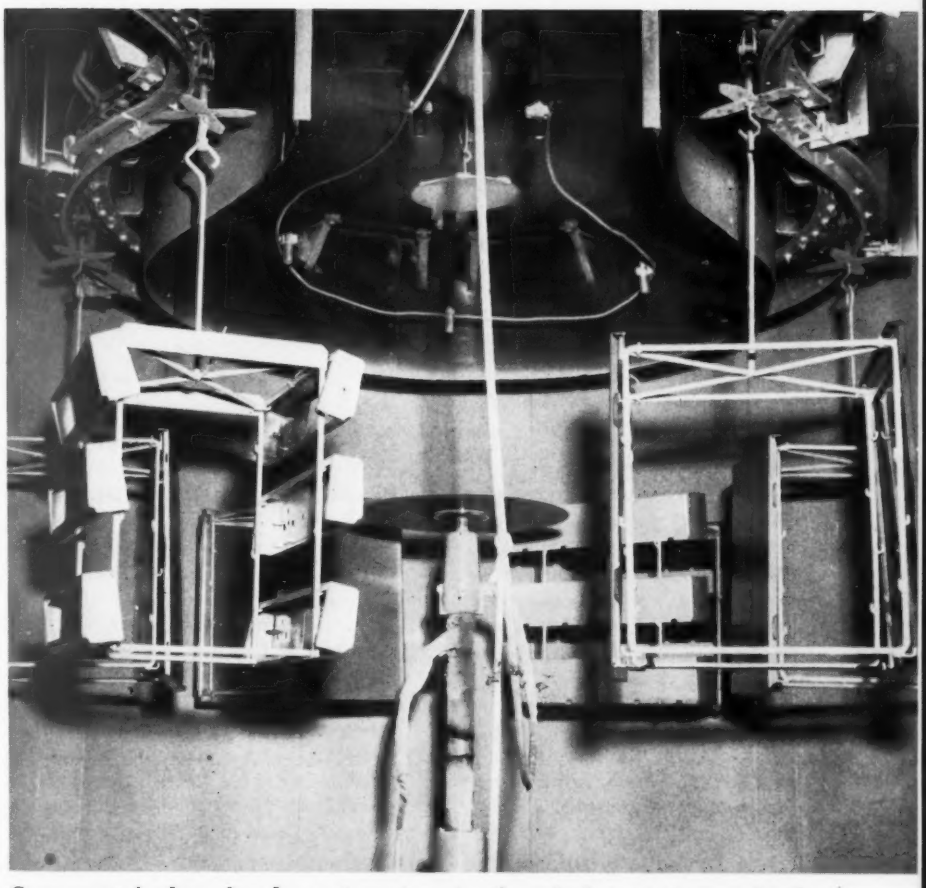
*Employee in compressor storage area receives "telautograph" message. He will place correct compressor on conveyor leading to refrigerator assembly line.*

THIS SECTION ON ORGANIC FINISHING at Kelvinator will cover the systems for the coating of home laundry equipment and refrigerator parts. While one system serves all the requirements for home laundry, there are two separate systems (senior and junior) for refrigeration.

### Home laundry system

Following fabrication, home laundry components in a wide variety of sizes and shapes are transferred to a conveyor which carries the parts through metal preparation and prime coat finishing. Among the parts to be finished are end panels, upper outer doors, lower outer doors, covers, lids, dial covers, instrument panels, fan housings for the dryer, and inner door covers for the dryer.

The miscellaneous parts, intermingled on the finishing system conveyor, travel through a five-stage cleaning and phosphatizing machine, including a 4,000-gallon cleaner tank with a 90-second cycle at 160-170° F.; a 3,200-gallon rinse tank with a 60-second rinse cycle at 135-140° F.; a 2,000-gallon phosphatizing tank with a spray cycle of 60 seconds at 120-125° F.; a 1,600-gallon cold rinse with a 30-second spray cycle at room temperature; and a 1,600-gallon chromic acid rinse with a 30-second spray cycle at room temperature. The process is concluded with a dryoff.



*Components for home laundry equipment passing through electrostatic spray booth. The 25-inch disc applies a .6 to .7-mil coating of white paint on each pass. The Kelvinator paint finishing department is equipped with two such booths.*

*Unique conveyor system in paint finishing department. Parts are suspended on arms which are carried through the department by a sub-floor conveyor. This system eliminates the problem of drippings from overhead conveyors.*

EXCLUSIVE MPM PHOTOS



The thoroughly dried parts then enter a flow coat machine located parallel to the metal preparation equipment just described. Here, an epoxy-type prime coat is applied at .3 mil to .6 mil in a machine designed to apply an even coating to all of the parts, irrespective of their design characteristics.

From the flow coat machine, the conveyor goes to a bake oven with multiple loops, where the prime coat is baked for 20 minutes at 425° F.

All interior parts and sub-assembly components requiring no cover coat are transferred to a conveyor which serves sub-assembly points at the second floor laundry assembly section.

At this same first floor transfer point, exterior parts or any components which are to receive cover coat are transferred to a conveyor feeding the electrostatic spray equipment. This conveyor carries the parts past the first of two electrostatic spray stations. Following the first spray station is a hand spray booth with two operators. An indexing device turns the ware between the two operators. Following this manual touchup, the ware is carried through the second electrostatic spray station. Here, all ware gets two light coats by electrostatic spray, prior to baking.

The ware then passes through a floor-level oven for baking the finish coat for 30 minutes at 300° F. All ware then goes immediately into a well-lighted inspection station for final inspection. Ap-

proved ware is transferred to the service conveyor which carries both prime coat and finish coat ware to second floor assembly.

At present, home laundry equipment has an alkyd-type finish coat, but Kelvinator is switching to acrylic-type finishes. Baked film thickness for the finish coat is 1.2 mils. This, plus .3 mils for prime coat, gives a total of 1.5 mils total coating.

In this system for home laundry equipment, four standard colors plus white are run on the same electrostatic equipment, which calls for careful scheduling and careful cleanup practices.

### Refrigerators, freezers, and ice cream cabinets

All major parts for refrigerators, freezers, and ice cream cabinets that are to receive organic finishing come out of fabrication on a service conveyor which parallels the conveyor for a cleaning and phosphatizing machine designed to handle these parts.

The seven-stage machine includes a 4,000-gallon cleaner tank with a 90-second cycle at 150-160° F.; a 2,100-gallon first rinse tank with a rinse cycle of 60 seconds at 135-140° F.; a 2,000-gallon second rinse tank with a 60-second cycle at 135-140° F.; a 2,200-gallon phosphatizing tank with a spray cycle of 60 seconds at 150-160° F.; a 1,400-gallon rinse with a 30-second cycle at room temperature; a 1,400-gallon chromic acid rinse with a 30-second cycle at room temperature; and a deionized water rinse to flush off salts.

As the ware leaves the dryoff oven, it is transferred to conveyor arms supported by an underfloor conveyor system. The undercarriage is a tricycle which rides under the floor to support a single, tubular, ware carrier which travels through a slot in the floor.

### The "senior" system

What Kelvinator plant men term the "senior" finishing system is a setup geared to take care of the all-white requirements.

The "tricycle" type conveyor carries the ware (in sets consisting of two refrigerator cabinets and two doors) into an enclosed, pressurized room.

At the first station, an operator in a pit below floor level sprays the under section of the cabinets and parts. This is followed by a staggered booth with four operators, two on each side, for spot or touchup spraying the fronts and backs of cabinets. Then comes a three-station, automatic, reciprocating spray unit, the first to coat the right side of all ware, the second to coat the left side, and the third for coating the tops of the ware. The automatic spray equipment setup has three guns on each reciprocating arm, and is set to deliver 1.7 mils film thickness. Following the automatic spray, there is a second set of staggered, manual booths, with one operator on each side for final touchup.

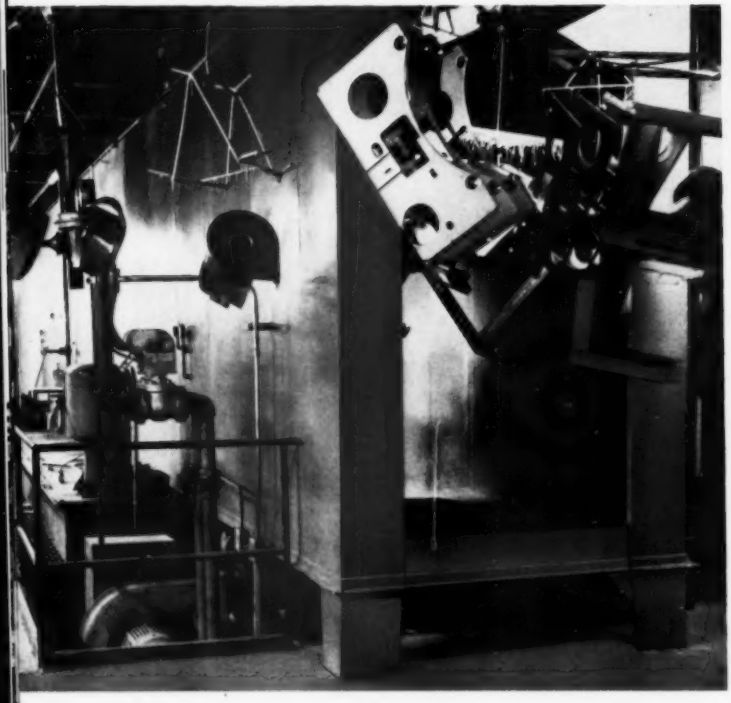
The conveyor then carries the sprayed ware to an on-the-roof bake oven for a 30-minute bake at 300° F. The oven is indirect gas fired.

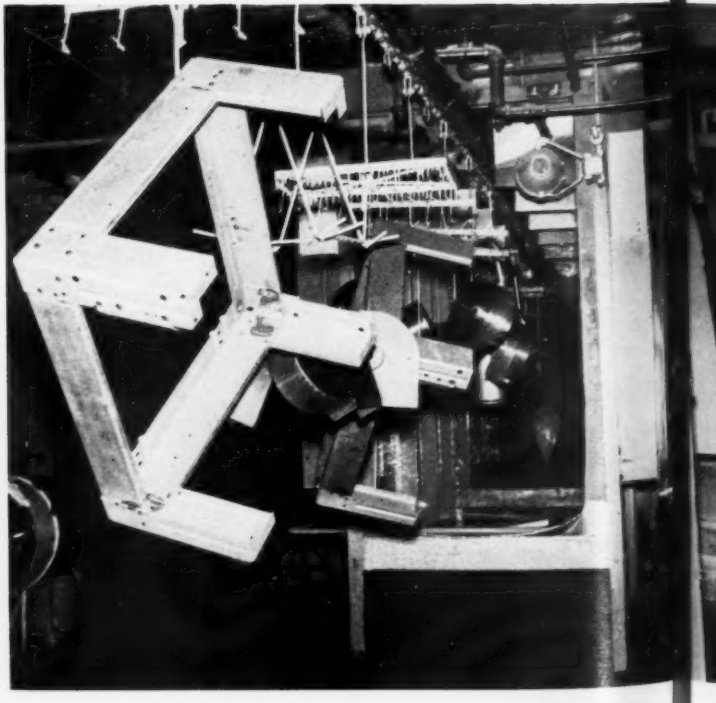
The conveyor then returns to the first floor for finish inspection. The approved ware is loaded onto the same service conveyor which was described as taking home laundry equipment to the second floor assembly. In the case of the refrigerator sets, the conveyor delivers these parts to the third floor for assembly or storage. In the case of ice cream cabinets and refrigerators, the conveyor delivers the shells for exterior cabinets to the wood mill, where the shipping skids are attached.

### The "junior" paint shop

In addition to the main line for all-white cabinet parts, a second, more flexible line is required for the application of colors and for finishing all miscel-

*(Left) — One of the cleaning and phosphatizing machines at Kelvinator. It serves the metal preparation unit for miscellaneous parts used in home laundry equipment. Parts on conveyor consist of blower housing and automatic washer assemblies, and dryer drum base supports. (Right) — Entrance end of the flow coat machine for home laundry appliance components. Parts shown on conveyor are automatic washer base and blower housing assemblies.* EXCLUSIVE MPM PHOTOS





laneous parts not readily adaptable to the automatic, high-production spray line.

Kelvinator offers four standard colors — Aztec copper, Bermuda pink, Surf turquoise, and Buttercup yellow — in addition to standard white. Since all cover coat from the senior spray line is reclaimed from a sludge pit, it is extremely important that no contamination gets into this enamel — one good reason for the "junior" line.

The more flexible junior line can handle all small runs or special coatings without interfering with the principal production line. This system is also used for ice cream freezers and other major parts in the refrigeration equipment line. This smaller paint setup has a pressurized spray room housing five operators in staggered positions.

From the spray room, the ware travels into a flashoff zone, and then into a hairpin-type oven at floor level. This oven is also indirect gas fired.

*Kelvinator's plant management meets to discuss the new exterior finish now being used on all automatic washers and dryers. (From left) — John Pietrzyk, superintendent of metal fabrication and paint; L. D. Thompson, industrial engineer; George H. Beld, works manager; Craig Hitchcock, chief inspector; Don E. DeVries, superintendent of planning; Herman Kladder, personnel director; and (right foreground) Ray A. Van Stee, director product quality.*

### Material mixing and handling

The paint mixing room is in a building detached from the main plant, and all materials except those for the junior line are prepared and supplied to the point of application through a re-circulating system. The paint storage room is of sufficient size so that refrigerator enamels can be purchased in tank car lots. A change is now being completed so that home laundry finishes can be purchased and stored in the same manner.

Outside the paint storage room are three 5000-gallon storage tanks for the thinners and reducers that are used in greatest volume. These are pumped directly into the paint mixing tanks from outdoor storage. The paint mixing tanks are elevated so the prepared material flows by gravity into the tanks for the re-circulating system.

Colors and finishes for special requirements on the junior line are stored in the original 55-gallon drums, which are equipped with air-driven propeller agitators.

EXCLUSIVE MPM PHOTOS

*(Below) — Operator in touchup booth, following the automatic spray on refrigerator cabinets. Finish coat is sprayed with a vertical, reciprocating, automatic spray machine. (Right) — This is a "white glove" inspection.*

# PORCELAIN ENAMELING

A UNIFIED PORCELAIN ENAMELING department at Kelvinator, incorporating two continuous furnaces, handles all of the porcelain enameled components required for the multi-product line. The major parts that are run in the department include refrigerator parts, range parts, and parts for home laundry equipment. The principal parts for refrigerators and freezers include liner, crisper pan, meat pan, and a bottom plate (inner plate) for the freezer. The principal parts for a typical 40-inch range include complete body, top, oven door and door liner, storage compartment door and liner, lower compartment door (a pull-out drawer at the bottom), oven liner and backguard. Part of the broiler grills and all broiler pans are also enameled, using ground coat only.

Enameled washing machine parts include outer tub, inner tub (spinner), top and lid. (On all-porcelain model automatic washers, the entire cabinet is porcelain enameled, and only the base is painted). Enameled dryer parts include the perforated drum and, on certain models, the top.

Both enameling grade and cold rolled steel are used for porcelain enameled products and, in one case, a combination of both for some refrigerator liners. All liners require that the tops and bottoms be fabricated of enameling grade steel to control sag, but on some models, the skirt (back and sides) of the same liner are fabricated of cold rolled steel.

### Arm-type pickling machines for metal preparation

There are two arm-type, immersion pickling machines, each with thirteen tanks. The number one machine is used largely for home laundry equipment, while the number two machine handles most of the refrigerator liners and range bodies.

Following is a description of the solutions and thirteen tanks of the number one machine:

1. A proprietary cleaner, 5500-gallon tank, at eight ounces per gallon, with rolling boil.
2. Overflow water rinse at 120° F.
3. Proprietary cleaner, 5500-gallon tank, at eight ounces per gallon, with rolling boil.
4. Overflow water rinse at 120° F.
5. Overflow, cold water rinse.
6. Sulphuric acid at seven per cent.
7. Same as tank six.
8. Same as tanks six and seven. (All acid tanks, six, seven, and eight, are maintained at approximately 150° F.)
9. Overflowing, cold water rinse.
10. Nickel solution, single nickel salt, 1 to 1¼ ounces per gallon, at 145-155° F., pH 3.0-3.5, nickel deposition 0.025 grams per square foot.
11. Dilute acid, approximately 0.5 per cent.
12. Proprietary prepared neutralizer, $Na_2O$, 0.099-0.149 per cent, at 140-150° F.

Following tank 13, there is a closed

*Loading a fabricated range body on arm-type conveyor leading to one of two pickling machines which serve the porcelain enameling department. Each machine has 13 solution tanks plus dryer.*

EXCLUSIVE MPM PHOTOS

*Underfloor tank is used for ground coat dipping of range bodies. Overhead spring-actuated balances simplify the operation.*

tunnel section with ceramic, infrared gas burners for dryoff. Approximate immersion times in the various tanks are: cleaners — 3 minutes, acid — 3 minutes, nickel — 5 minutes, and neutralizer — 1 minute.

The number two pickle machine carries approximately the same solutions as in the case of number one, except that in the place of the nickel solution and dilute acid solution there is a dilute neutralizer to prevent rusting during this part of the cycle. The number 11 rinse tank also carries this dilute neutralizer solution.

### Materials and preparation

All refrigerator parts are enameled with a titanium-type cover coat, over a standard ground coat, both fired at the same temperature, 1500-1520° F., for approximately two minutes.

A different type of cover coat, fired at a slightly higher temperature, 1520-1540° F., is used on all range parts and for all home laundry equipment. This enamel, which combines resistance to acid and alkali, has a firing time of from two and one-half to three minutes, depending on the type of part — the three minutes being for 16-gauge range tops. As in the case of the refrigerator enamel, a ground coat has been adjusted to the range-home laundry enamel for firing at the same time and temperature as its companion cover coat.

High density porcelain balls are used as a grinding medium, in mills lined with conventional porcelain lining brick. All enamel slip passes through a screen and magnetic separator as it is transferred from the mills to overhead storage containers. In addition, all enamel slips are centrifugal sieved and magnetic separated as they are loaded by gravity from the overhead containers into 30 and 60-gallon pressure tanks or dip tanks.

Weight of ground coat application is 18 to 20 grams per square foot, dry weight, and 20 to 23 grams per square foot for cover coat. The fired thickness is checked both in ground coat and cover coat. Ground coat standard is 2½ to 3 mils, and cover coat standard is 3½ to 4 mils, or a total fired enamel thickness of 6½ to 7 mils. Normally, 90 per cent of the finished liners will pass final inspection following one cover coat application.

### Most ground coat dipped

All ground coat enamel is dipped, except for range tops and range back guards. These two items are sprayed with semi-automatic stationary guns. The guns are placed at various angles to get as complete coverage as possible as the ware is conveyed through the spray station. There are hand touchup stations following the automatic, for hard-to-get-at recesses and edges.

Range bodies and washer tubs are ground-coat dipped in under-floor tanks.

Refrigerator liners are dipped in above-floor tanks manually and placed on drain racks at an angle. On the outer tubs for the washer and dryer drum, the dipping arrangement is handled by an overhead cable hoist by one operator.

The heavier range bodies are hung on two overhead, spring-actuated balancers. An operator on each side of the unit pulls a balancer cable down to connect with each side of the range body, and then swings the unit into the underfloor dip tank. With slight manual help, the body is easily immersed and released from the ground coat tank. At this point, a third man engages a conveyor tool for positioning the range body on a dryer suspension bar.

### Cover coat application

Cover coat for flat ware is applied on a laydown, pin-type conveyor feeding an automatic spray booth. Four reciprocating guns are normally used, but the arrangement is such that six can be hooked up if there is requirement for it. There are hand touchup stations following the reciprocating guns for hard-to-get-at flanges and edges.

Cover coat for refrigerator liners is sprayed manually with liners positioned in cradles on conveyor for optimum accessibility to all interior areas.

Cover coat is sprayed manually to range bodies suspended so that enamel can be applied to sides which are in a vertical position.

### Dryers and furnaces

For ground coat, there are two monorail conveyor-type room dryers with gas ribbon, open-flame heating.

For cover coat, there is a large dryer for range bodies, refrigerator liners, freezer liners, etc. This monorail conveyor dryer, in addition to having ribbon-type, open-flame burners, has an indirect heat source using gas and forced air convection.

A second cover coat dryer serves the laydown, pin-type conveyor for flat ware, and is heated by conventional, open-flame, ribbon-type burners.

*to next Page* →

EXCLUSIVE MPM PHOTOS

*Touchup follows dipping operation for porcelain enameled refrigerator liners.*

Both furnaces are of equal size. They are gas-fired, U-type units, with nine burners each, and approximately 50-foot hot zones. One of the furnaces has a center wall in the hot zone chamber.

Due to the fact that all dryers with monorail equipment and the two furnaces will take maximum size parts required for ranges and refrigerators, the porcelain enameling department has extreme flexibility. With the proper balance of production, for instance, ground coat can be run on one furnace and cover coat on the other. Or, when variations in production requirements make it desirable, ground and cover coat can be run on the same furnace, regardless of the size of the part. (As indicated earlier, this would not include the intermixing of refrigerator parts with range or home laundry parts, due to differences in enamel composition.)

The furnace chains are so arranged that either range bodies or refrigerator liners in cover coat can easily be loaded onto either chain without inconvenience.

Liners get on-conveyor inspection in ground coat, for slight lumps or minor defects of this type are stoned down by the operating inspector. If there are "dings" or defects that cannot be corrected on the line, the parts are set aside for the repair section. The final inspection of liner interiors in cover coat is done on the furnace chain near the take-off end, where two inspectors using special lighting conditions inspect each liner carefully.

All range parts and refrigerator liners get a standard PEI acid resisting test and must show a minimum of Class A acid resistance.

### Alkali resistance test procedure

The plates to be tested are sprayed with ground coat to the equivalent of 20 grams per square foot, dry each side, to give a fired coating of approximately .003 in thickness. For cover coat testing, the ground coat is applied in the same manner, but at a maximum of 15 grams per square foot, dry each side, and the cover coat is applied on both sides and edges at application weight of 25 grams per square foot on each side. Before testing, all burrs and sharp edges are filed. Care is taken to cover all edges, keeping edge beads at a minimum. Samples are fired in a hanging position at optimum firing temperature for each enamel.

After firing, they are washed with a mild detergent, rinsed with clean distilled water, dried with a clean towel, and placed in a constant temperature oven (105° C.) for 10-15 minutes. They are then allowed to cool, weight determined on an analytical balance in grams to four decimals, and weight recorded.

Plates are then placed in a 1200-ml. stainless steel beaker, being careful that plates do not touch, containing an 800-ml. solution of five per cent sodium pyrophosphate at a temperature of 206° F. plus or minus 2°, and allowed to remain for six hours. The 1200-ml. beaker is suspended in a 3300-ml. beaker containing water bath with a constant water level regulator attached. Test solutions have a W/A ratio (weight of chemical to square inches of area attack) of 1.25 grams. A watch glass, with a hole in the center to accommodate a thermometer, is used as a cover for the 1200-ml. beaker.

After the required time of immersion, the plates are removed with tongs, scrubbed with a mild abrasive powder, rinsed with clean distilled water, dried with a clean towel and placed in a constant temperature oven (105° C.) for 10-15 minutes. They are then allowed to cool; again weight is determined on an analytical balance in grams to four decimals, and weight recorded.

The difference between weights of plates before and after test is recorded in milligrams of enamel lost per square inch during test.

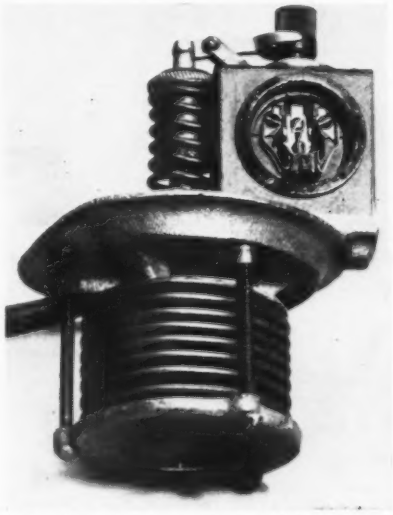
*Take-off point for fired porcelain enameled liners, which are transferred from cover coat dryer chain to furnace chain traveling to the inspection station.*

## Kelvinator history

→ *from Page K-24*

president of the Appliance Division, and a capable team of top executives, Kelvinator forged ahead during 1959 to show significant sales increases in the United States, Canada, and England, and an improvement of its world-wide position through the addition of new licensees.

During the past year, the division recorded a sales increase in the domestic market of 30.6 per cent in 1959 on the ten appliances in the Kelvinator line, a rate of increase approximating three times the industry average. At the same time, Kelvinator International increased sales 10.6 per cent, and a more recent report shows that from October through December, 1959, this operation showed a gain of 70.9 per cent over the same period for the preceding year.



*This little device cost $125,000, but it made possible electric automatic refrigeration. It's a thermostat, the first dependable refrigerator control that started and stopped the refrigerator automatically in response to changes in temperature. Development of this thermostat by Edmund J. Copeland, one of the founders of Kelvinator, made possible the modern electric household refrigerator.*

Kelvinator executives are quick to state that the progress shown during recent months by the Appliance Division was not merely the result of additional sales promotion, but involved plant consolidation, development of manufacturing efficiency, a strengthened dealer organization, increased advertising support, and clearly explained product philosophy. The latter point is exemplified by the announcement of the elimination of "annual models" in favor of a progressive product improvement policy.


# Congratulations to Kelvinator

We at H. A. Davidson Box Company are pleased to have played a part in helping Kelvinator achieve their outstanding sales gains last year. We are happy that we can be counted among the many leading suppliers currently serving the Kelvinator Division of American Motors.

H. A. Davidson Box Company has been serving Kelvinator for over 20 years. We believe this to be evidence that we provide a quality product, competitively priced, with on-time delivery.

If your organization is looking for an established, reliable source for industrial wood parts and packaging and shipping materials, we would welcome your inquiry. Write or phone today.

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DETROIT 27, MICHIGAN

**Romney** *(from Page K-13)*

philosophy, because it is contrary to the real interest of the buyer and the consumer.

Most people in the appliance business know Kelvinator's traditional product emphasis on quality and consumer benefit, rather than on gimmicks and gadgets. By breaking the model change habit, we are giving logical extension to this traditional concept:

First, by starting with product improvement rather than traditional arbitrary sales deadlines.

Second, by concentrating on functional change rather than superficial differentiation.

Third, by removing the calendar pressures that foster costly and unnecessary facelifts.

Fourth, by examining the myth that appliance dealers like to be smitten annually, and virtually at the same time, by a dozen different new models from a dozen different manufacturers.

We think that by concentrating on product improvement, we will speed up genuine basic improvements. We know that our engineers and development and research people are going to be able to devote more time to those things that really count. After all, that is how you achieve progress.

We hope that this extensive review of Kelvinator's operations by METAL PRODUCTS MANUFACTURING will serve as a comprehensive portrait of Kelvinator's progress to date.

**Chapman** *(from Page K-15)*

trust and fairness are more effective in bringing people together and bridging the differences between nations than most official friendships by government decision.

What have been the results of this policy in the world appliance market?

Kelvinator's growth last year showed an upturn in exports from the U.S. as well as increases in home market business for our English and Canadian subsidiaries, and expansion of our worldwide licensee organization.

Kelvinator of England Limited sold more refrigerators in the British home market during the month of May last year than it did during an entire year as recently as three years ago. For the fiscal year, Kelvinator of England increased its unit sales to the home market by more than 32 per cent.

In Canada, where the Kelvinator brand name has been in a top position in the appliance industry for many years, sales increased nearly 13 per cent in 1959 over 1958.

The size of the international operations has more than doubled since World War II. Three new licensees were signed last year and plans call for further expansion.

The most recent licensing agreement was signed with the Matsushita Electric Industrial Company, the largest electric appliance manufacturer in Japan. This company will produce Kelvinator and Leonard brand refrigerators and compressors of Kelvinator design for the Japanese home market, and certain markets in Southeast Asia. The addition of Matsushita brought the total number of licensees to 16, including Argentina, Australia, Colombia, France, Germany, Greece, India, two in Italy, Mexico, Norway, New Zealand, Philippines, Spain, and Sweden.

Throughout the free world, economic conditions have steadily improved in recent years, and millions of people for the first time are able to satisfy their wants above the level of mere subsistence.

While we have long considered the principal market to be in the U. S., there remains outside of this country 94 per cent of the world's population with a host of unsatisfied wants.

The conclusion is that the worldwide appliance market should become even greater than that in the United States where the future has been confidently forecast in terms of never-before-attained prosperity.

Throughout the world, national needs and aspirations, tremendous growth in other highly industrialized nations,

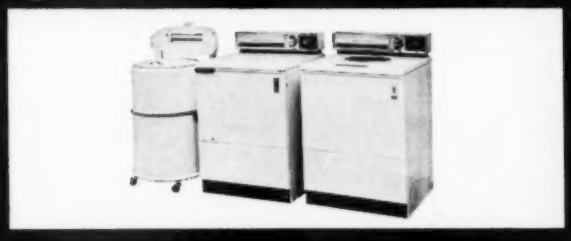
**AROUND THE W**

and higher U. S. costs have laid a groundwork for a tremendous world market.

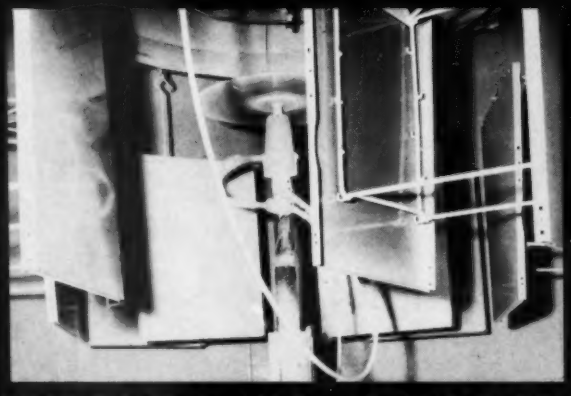
Kelvinator's policy over the years has been to achieve its place in the world appliance market on a partnership basis with nationals of other countries. The growth of our licensing and distributing organizations since World War II has confirmed our belief in the soundness of this approach and strengthened our confidence that Kelvinator is positioned to capitalize on the wordwide opportunities that are appearing. ■

# E WORLD WITH KELVINATOR

KELVINATOR
Washers and Dryers



Get their High Quality Finish with



RANSBURG NO. 2 PROCESS

Kelvinator Division of American Motors switched from hand spray to RANSBURG No. 2 PROCESS Electro-Spray to meet increased production schedules . . . improve the quality of the finish . . . and lower finishing costs.

SAVINGS EXCEEDED EXPECTATIONS

Demonstration tests in the Ransburg labs indicated substantial savings in finishing costs, but in actual production, SAVINGS ARE EVEN GREATER than estimated. That's why Kelvinator is now considering RANSBURG Electrostatic Spray Painting for other products of their "white goods" line: Refrigerators . . . Home Freezers . . . Ice Cream Cabinets . . . Electric Ranges, as well as some components.

NO REASON WHY YOU CAN'T DO IT, TOO!

Want to know how Ransburg No. 2 Process can improve the quality of YOUR painted products, and at the same time, cut YOUR paint and labor costs? Write for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the new No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized, or non-conveyorized painting.

RANSBURG

RANSBURG
Electro-Coating Corp.
Box-23122, Indianapolis 23, Indiana


## Assembly

→ *from Page K-33*

motor, inner and outer tubs, damper, belt pulleys, and the reset control are added. Two belts are used, one for the main drive and the other for the water pump. Then the tub is filled with water from an overhead hose, and the unit is checked carefully for leaks.

When the leak test is completed, the outer housing is attached and bolted in place. The unit proceeds down the line, the lid and back panel are attached, and the wiring is connected. A power circuit is hooked up and the washer is given a complete operational test. The surface of the finished unit is inspected, and any flaws are touch-up painted with a hand spray gun. Drying is done in an infrared oven. The washers and dryers (which join the washer line prior to the touch-up station) are then packaged in cleated-corrugated containers.

The final phase of Kelvinator's automatic washer "product quality" program is a rigid operational test performed on units selected at random, which have been packaged and are ready for shipment. This testing is carried out by trained technicians in a laboratory adjacent to the assembly line.


*MPM is grateful to the following Kelvinator personnel for the part they played in the development of this special section:*

GEORGE ROMNEY, *President, American Motors Corporation*
BERNARD A. CHAPMAN, *Executive Vice President and General Manager of Kelvinator Division*
HOMER L. TRAVIS, *Vice President, Kelvinator Sales*
HERSCHEL F. POWELL, *Director of Appliance Engineering and Research*
OWEN D. MARTIN, *Chief Refrigeration Engineer*

*Grand Rapids Plant*

GEORGE H. BELD, *Works Manager*
JOHN SCHUCK, *Assistant Works Manager*
JOHN PIETRZYK, *General Superintendent Press, Weld, Fabrication and Paint*
DON DEVRIES, *Production Manager*
L. D. THOMPSON, *Manager of Industrial Engineering*
R. A. VAN STEE, *Director of Product Quality*
W. D. NICOL, *Porcelain Enamel Process Engineer*
W. R. WHYTE, *Manufacturing Services Department*
F. J. BRAUMSCHNEIDER, *Engineer — Kelvinator International Corporation*

DETROIT CONGRATULATES KELVINATOR

# guarantees a full tub with pressures from 5 to 20 psi

## here's how

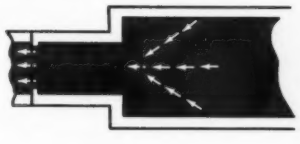
One thing about a housewife—she can really complain when her appliances don't perform as they should. Take a washing machine, for example. She'll never understand that varying water pressures caused by a low-volume well, heavy summer lawn sprinkling or low pressure suburban systems, will frequently prevent her from getting a full tub of water. And the onus in her mind is strictly on the manufacturer.

But it needn't be. Detroit Controls has just announced a new—*improved*—N-10 washing machine valve that provides a full tub despite water pressures which might vary from 5 to 20 psi or more! The secret is a new device that assures positive flow control under abnormal pressures. And, of course, it provides equally top performance during normal conditions. Using superior components assures superior products. The N-10 is an example.

Write Detroit Controls, 5900 Trumbull, Detroit 8, Michigan for complete information.

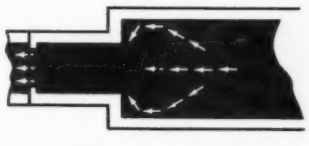
**FULL PRESSURE**

. . . depresses the flow-control washer into a spring-loaded seat. Water passes through center orifice only.



**LOW PRESSURE**

. . . is not sufficient to seat the flow-control washer. Water passes around washer as well as through the center orifice.



See Detroit Controls at Booth 1230 Design Engineering Show New York City May 23-26.

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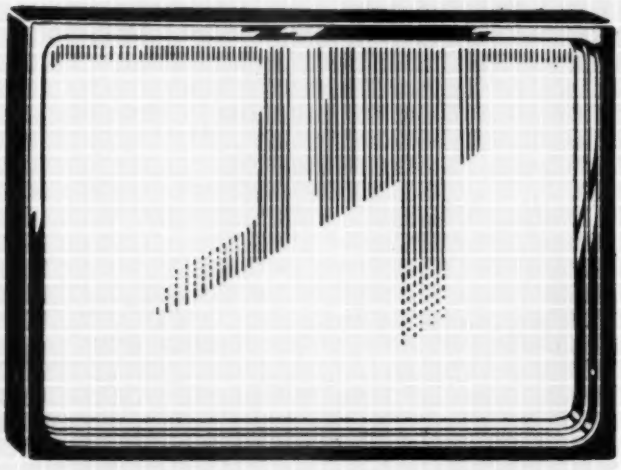
AMERICAN-Standard

DETROIT CONTROLS DIVISION

# KELVINATOR, one of the long line of satisfied PERMA-VIEW® users.



**Kelvinator Division, American Motors Corporation, one of the 85 leading range manufacturers using Perma-View oven door windows.**

As a practical, economical and effective component, PERMA-VIEW can be your best sales feature. Be sure you take advantage of this sales feature in your new models—either free-standing or built-in.

The strong steel encased, double pane PERMA-VIEW window incorporates the finest quality heat resisting glass. It is mechanically sealed to prevent infiltration of vapors and to eliminate "fogging." This "No-Fog" window meets the constantly growing demand for "visible baking." We can manufacture any shape, any size, any thickness to meet your engineering requirements. Rectangular—round —square—trapezoid. Alternate methods of attachment may be used.

Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on the ease and economy of adding this sales feature to your new ranges.

THIS IS A GENUINE PERMA-VIEW NON-FOG

out of our CARTON . . .
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# MPM

**new industrial literature**

## Water-Tight Pilot Lights

A new series of sub-miniature pilot lights that are water-tight on the face of the panel are described in a recently published bulletin. Water-tightness is achieved by means of a flat, 1/32-inch-thick neoprene gasket on the shank of the lens holder, and a 1/16-inch-thick retained "O" ring seal behind the flange of the mounting bushing. For a copy of Bulletin L-162 write Dept. MPM, Dialight Corp. 60 Stewart Ave., Brooklyn 37, N. Y.

## Aluminum in Architecture

Comprehensive information compiled to assist architects and others in the selection of aluminum alloys and surface finishes for a vast array of building industry applications is contained in a new booklet, "Aluminum for Architecture." The 20-page booklet contains guides to mechanical finishes, with a listing of the designations set up by the company and the counterparts of these established by the National Association of Architectual Metal Manufacturers, as well as descriptions of the various textured, bright, or satin surfaces, and how they are achieved. For a copy of the booklet, write Dept. MPM, Metals Div., Olin Mathieson Chemical Corp., 400 Park Ave., New York 22, N. Y.

## Hole Punching and Notching Units

A new catalog provides dimensional drawings of seven standard hole punching units for punching round and shaped holes. Also included in the catalog are notching units, "V" notching units, and edge notching units. For a copy of Catalog B, write Dept. MPM, Punch Products Corp., 3800 Highland Ave., Niagara Falls, N. Y.

## New Packaging Process Shown

An illustrated brochure that describes an electronic packaging process is offered by this manufacturer. Said to save time and money, the process is applicable to any type of manufactured metal product requiring fasteners in packaging, including appliances, business machines, vending machines, and metal furniture.

The process will sort assembly materials in different sizes and assortments and package items in either translucent or kraft opaque bags up to 4½" by 4½" in size. It will also print up to three lines of copy on the side of the package. To obtain a free copy of the brochure, white to Dept. MPM, Mid-Continent Screw Products Co., 5844 N. Broadway, Chicago 40, Ill.

## Small Motor Reference File

This company offers a new quick reference file on the complete line of their ac small motors: unidirectional, reversible, synchronous. Up to 1/20 hp. With or without reduction gearing — open or enclosed types. Stator and rotor sets also available. For your copy write Dept. E, Barber-Colman Co., 1292 Rock Street, Rockford, Ill.

## Finishing Systems Bulletin

This bulletin outlines the production savings possible with automatic finishing systems. New synthetics have been altering requirements in finishing equipment. Also new material handling methods have introduced new ways to organize finishing production to lower handling costs. For a complete roundup write for bulletin No. 51, Dept. MPM, Despatch Oven Co., 619 S. E. 8th St., Minneapolis, Minn.

## Spray Coating And Painting

This bulletin offers complete information on automatic hydraulic spray coating and painting. It outlines methods and equipment used. Write for bulletin 96, Dept. MPM, Spraying Systems Co., 3203A Randolph St., Bellwood, Illinois.

## 1960 Idea File

This file has hardware ideas to help you put profitable extras into your products. It covers all types of hardware such as: latch mechanisms, knobs and handles, hinges of all types, balancers, and special devices. The company offers thousands of stock items or design service to create new designs. Write for 1960 Idea File, Dept. MP50, Amerock Corp., Industrial Sales, Rockford, Ill.

## Roll Formed Shapes Catalog

This catalog outlines the benefits of roll formed shapes. It points out that it produces shapes from carbon, galvanized and stainless steel, aluminum, copper, zinc and clad-metals. Write for catalog No. 1555, Roll Formed Products Co., Dept. MPM, 3758 Oakwood Ave., Youngstown, Ohio.

## Name Plates And Trim

This technical bulletin covers the subject of die cast name plates and decorative trim. It describes the many types of finishes and fasteners available plus the design and engineering facilities available. For your copy write Dept. MPM, La France Precision Casting Co., 29th & McKean Sts., Philadelphia 45, Pa.

## Tap Selector Reference

A 28-page tap selector spells out in detail the correct tap to use for optimum production, regardless of the material, type of hole, etc. By means of easy-to-use reference charts all necessary information is cross-referenced for easy checking by the engineer, production man or purchasing agent. For a copy of "Tap Selector," write Dept. MPM, The Hanson-Whitney Co., Hartford, Conn.

## New Acrylic Enamel

This free book provides detailed information on new Duracron acrylic enamel. It is claimed that this material gives better adhesion, greater hardness and improved resistance to staining and corrosion. For free copy write Dept. MPM, Pittsburgh Plate Glass Co., Industrial Finishes Div., 1 Gateway Center, Pittsburgh, Pa.

## New Lubricant Bulletin

This new bulletin describes Molykote G lubricant. It is claimed that this lubricant does the following: almost 100% safety against galling and seizing with all bearing metal combinations, eliminates stick-slip, metal pick-up and distortion in press fitting, and reduces wear-in time and damage in new or rebuilt machinery. Write for a free sample and bulletin 126 from Dept. MPM, The Alpha-Molykote Corp., 65 Harvard Ave., Stamford, Conn.

## Coil Cradles Catalog

This bulletin describes this company's line of coil cradles — plain and motor driven and one and two ton capacities. The standard motor driven coil cradle feeds 600 inches of stock per minute. They are also built with variable speed drives for infinite feed range of 100" to 600" per minute. For your free copy write for catalog B, Dept. MPM, F. J. Littell Machine Co., 4143 N. Ravenswood Ave., Chicago 13, Ill.

## Pilot Light Manual

Permanent pilot lights are described in a complete technical manual and catalog. It is claimed that these lights are designed for up to 25,000 hours of operation and are easily attached to panels of any thickness by a vibration-proof speed nut, combining permanent

mounting with production economy. They are available in a variety of styles to meet your design requirements. Write Dept. MPM, Industrial Devices, Inc., Edgewater 13, New Jersey.

## Industrial Equipment Catalog

This catalog covers the complete scope of this company's equipment for metal finishing, cleaning, painting, heating, heat treating, etc. Write for catalog A-600, Dept. MPM, The R. C. Mahon Co., Detroit 34, Michigan.

## AC Motor Catalog

This catalog covers a complete line of ac motors ranging from 1/1800 to 1/35 hp. It has complete information on this 40 year old company's experience and line of motors. Write Dept. GF, The General Industries Co., Elyria, Ohio.

## Press Catalog

This fact filled catalog has complete information on a new line of O.B.I. presses. It explains how expensive downtime, as a result of clutch and brake maintenance, can be eliminated as a result of a new sealed-in-oil drive. Write Dept. MPM, Clearing Div., U S. Industries, Inc., 6499 W. 65th St., Chicago 38, Ill.

## New Blower Booklet

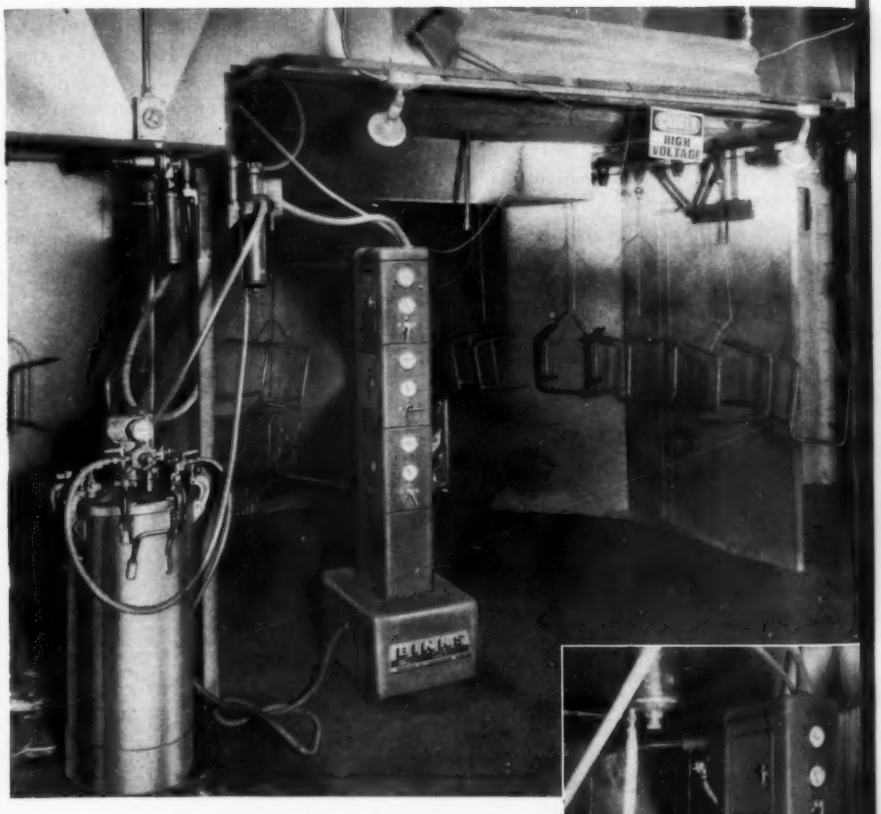
A colorful, illustrated 12 page booklet describes a standard line of blower assemblies, blower wheels, and parts. Each blower and wheel is detailed with cross-reference to the Lau engineering catalogue. In another section, the various types of wheels now being produced by the company are described. These include large diameter riveted wheels, single and double inlet weld wheels and the A series and DD Preslok wheels. The new brochure is available, without charge, from Dept. MPM, Blower Division, The Lau Blower Co., 2027 Home Avenue, Dayton 7, Ohio.

## Catalog on 2800 Standard Socket Screw Items

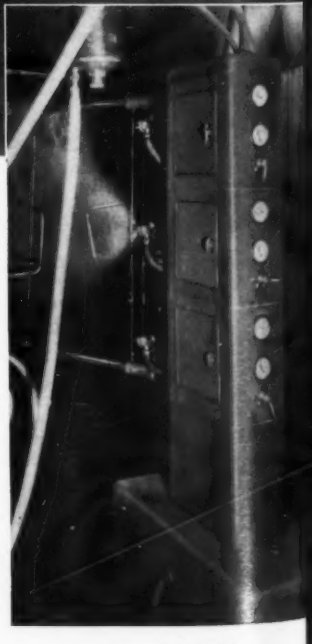
A new technical reference on industrial socket screws — believed the most complete ever compiled is now available. The illustrated 82-page textbook on the subject includes both standard catalog data and extensive design and performance information on a family of fasteners used in virtually all industries. Titled, "Unbrako Socket Screw Catalog and Engineering Standards," the publication covers more than 2800 items. These include socket head cap screws, set screws, shoulder screws, button head screws, pressure plugs and socket screw keys. Additional product lines reviewed are Unbrako square head set screws and dowel pins. Designed to answer 90 per cent of those questions which have led to salesman callbacks through the years (and to aid in user value analysis), the reference publication is intended as a handy working aid for purchasing agents, design engineers, and production people alike. For a copy of the Unbrako Socket Screw Catalog and Engineering Standards, write K. L. Scott, Advertising Department, Box 1089, Standard Pressed Steel Co., Jenkintown, Pa.

## Paint Spray Hose

Literature detailing the complete line of paint spray hose is now available. Pertinent information on applications, cover, reinforcement, tube, lengths, packaging, and recommended couplings is outlined with each fluid and air hose illustration. A special reference section illustrating and describing the company's modern manufacturing facilities is also included. Write Dept. MPM, Swan, Rubber Co., Bucyrus, Ohio.




One man now handles spraying operation formerly requiring two. Binks unit needs only occasional monitoring. The second man is now needed on the packaging line because of increased production.



Electrostatic charging of paint particles keeps overspray to a minimum, gives a more uniform coating.

## Facilities Booklet

Facilities for research and development and for production of laminated plastic and vulcanized fibre, as well as for fabrication of the versatile engineering materials into finished parts, are illustrated and briefly described in a new 12-page bulletin. Included are thumbnail descriptions of what laminated plastics and vulcanized fibre are and how they are made. Simple sequence drawings show how each material is made. For a free copy of the facilities booklet, write Dept. MPM, Taylor Fibre Co., Norristown, Pa.

## Brochure on New Input Regulator

Design information covering a new input regulator which provides infinite control for a wide variety of electrical equipment commercial devices and home appliances is provided in a publication now available. The product, designated Model INF, is a bimetal regulator designed to control a wide selection of electrical inputs to a heating element or similar device. It is about the same size as an ordinary five-heat rotary switch. Any resistive load up to 15 amperes can be controlled. The product is claimed to offer outstanding control advantages for such applications as: annealing equipment, automatic signs, coffee urns, commercial cooking equipment, commercial hair dryers, griddles, hot plates and humidifiers. The publication is available from Dept. MPM, Indiana Div., Robertshaw-Fulton Controls Co., P.O. Box 129, Indiana, Pa.

## Reference Chart for Printed Circuit Draftsmen

A unique quick reference chart for printed circuit draftsmen has just been issued. This is a copyrighted six page table which includes all of the pre-cut shapes and sizes of pressure sensitive drafting aids required to make paste-up printed circuit drawings that will conform to military specifications, together with many new non-military configurations. Illustrations are provided in a convenient chart form for easy cross reference between corresponding donut pad, teardrop pad and twin pad sizes. It is claimed that this is the only chart published which provides draftsmen with actual size illustrations of the shapes and the available hole diameters for each. This new chart will be mailed free to any draftsman requesting a copy from Dept. MPM, By-Buk Co., 4314 W. Pico Blvd., Los Angeles 19, Calif.

## Springs

Over 750 different springs that are available for immediate shipment from stock are listed in this 20-page catalog. Catalog contains complete engineering data and prices. Springs covered are both compression and extension in stainless steel and music wire. Write Dept. MPM, Lee Spring Co., Div. of Leetronics, Inc., 30 Main St., Brooklyn, N. Y.

## Fractional Horsepower Motors

A new 12-page catalog describes and illustrates a basic line of fractional horsepower electric motors, blowers, and special products. For the latest information on this complete line, write for your free copy to Dept. MPM, Redmond Co., Inc., Owosso, Mich.

## "No Lost Production Time"

Works manager, industrial engineers and others interested in increasing plant efficiency and cutting costs will find the new booklet packed with valuable thought-provoking information. The booklet, "No Lost Production Time," explains the importance of "Quality manufacture supported by scheduled


at Lu Van, Inc., furniture manufacturers, Belding, Mich.

Binks modular electrostatic spraying ups finishing production 40%

"Our finishing production increased 40% since installing a Binks electrostatic spraying machine," reports Mr. A. G. Van Syoc, Jr., president of Lu Van, Inc., fast growing manufacturers of contemporary furniture.

"Records also show," states Mr. Van Syoc, "a 15% cut in finishing costs and a 10% savings in paint. We feel that in every regard our Binks machine has vastly improved efficiency, product quality and operational flexibility."

**Installation costs cut**

Use of the existing Binks spray booth kept installation costs at a minimum. Designed for Binks integrated spraying systems the water-wash booth, formerly used for manual spraying, was incorporated in the automatic set-up without costly modification.

**Lower cost, quality finishing**

Thousands of manufacturers, like Lu Van, have increased both quantity and quality of spray finishing production with the help of Binks' engineers and equipment. They can help you, too. Whether your need is for a single unit or a completely integrated, highly automated system, Binks has the knowledge and exact machines to speed up your operation and produce superior finishes.

**Free finishing analysis**

Binks will show you the application method best suited to your needs. An analysis is made under production conditions with your products and your finishing and coating materials. You're not obligated in any way. Just call your Binks branch office or write direct to the address below.

*Ask about our spray painting school*
*Open to all...NO TUITION...covers all phases*

Binks
EVERYTHING FOR SPRAY PAINTING


SPRAY GUNS


AIR COMPRESSORS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Binks Manufacturing Company
Carroll Avenue, Chicago 12, Illinois

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*For the best in plant and equipment cleaning*

# ask Oakite

OVER 50 YEARS CLEANING EXPERIENCE • OVER 250 FIELD SERVICE MEN • OVER 160 MATERIALS

## CLEANING DIES? Strip them bare in a single solution—OAKITE RUSTRIPPER

If it's a maintenance cleaning job, make it a part of a planned program. Take cleaning prior to reconditioning dies and tools, for example. An Oakite Planned Maintenance Program suggests how to get it done at the lowest possible unit cost.

First, tools and dies are simply soaked in Oakite RUSTRIPPER. In just a few minutes, RUSTRIPPER removes rust bloom, paints, shop soils, metal chips, smuts, lubricants . . . leaves tools gleaming clean and naked for visual inspection. Then, a quick dip in Oakite SPECIAL PROTECTIVE OIL keeps rust bloom from forming before reconditioning. Or if they're going into storage, tools and dies get a fast coating of Oakite STEEL PRESERVER for long-term, heavy-duty rust protection.

Ask the Oakite man about a Planned Maintenance Program. He'll gladly give you tips on time-and money-saving materials and methods for plant-wide maintenance cleaning. Meanwhile, send for this PLANT MAINTENANCE CLEANING GUIDE, which gives complete details. Oakite Products, Inc., 26 Rector Street, New York 6, N. Y.

*it PAYS to ask Oakite*

OAKITE

over 50 Est. 1909 SCIENCE

*years' leadership in industrial cleaning*

maintenance." It presents a case history showing how one stamping press operated 11 years without a single day lost to downtime. An exceedingly valuable article is titled, "What Does Downtime Cost?" If you feel "Downtime" is costing you too much, you are invited to write for a copy of this brochure. Write Dept. MPM, Danly Machine Specialties, Inc., 2100 S. Laramie Ave., Chicago, Ill.

## "Simple Methods for Analyzing Plating Solutions"

A 36-page, two-color booklet describes simple analytical methods for plating solutions. The procedures outlined may be easily and rapidly carried out by non-technical personnel. It is prefaced by a discussion of analytical principles, use of apparatus and methods for sampling a plating solution. The booklet outlines in detail step-by-step procedures involved in a number of analytical methods for testing nickel, copper, silver and other metalfinishing solutions. Other sections of the booklet describe necessary equipment, component chemicals of solutions, atomic weights, acid concentrations and electrochemical data. Conversion tables are included. Analytical reagents are listed for all types of plating solutions. To get a free copy of "Simple Methods for Analyzing Plating Solutions", write Dept. MPM, Hanson-Van Winkle-Munning Co., Matawan, N. J.

## Fusion Welding Aluminum

"Fusion Welding Aluminum," is the latest addition to a comprehensive series of technical handbooks on joining methods for aluminum. The paperbound, 6" x 9" 32-page booklet covers gas welding, metal arc welding, TIG (Tungsten, Inert-Gas) welding, straight polarity TIG, MIG (Metal, Insert-Gas) welding, TIG welded joint design, and MIG welded joint design. The new technical handbook is available on letterhead request from Dept. MPM, Reynolds Metals Co., Dept. PRD-31, Richmond 18, Va.

## Cap Screw Bulletin

A new Cap Screw Bulletin giving complete specifications, dimensions and data on the new 1960 Cap Screw series has just been published. The new bulletin illustrates and describes the advantages and features of the new series and includes a forthright comparison of the dimensions of both the new series and the old. Also contained in this bulletin are full particulars as to when the change will be made to the new series and some worthwhile suggestions for users of Cap Screws about when to make the change and how to do it with the least amount of confusion. Ask for the new '60 series Cap Screw Bulletin. Write Dept. MPM, Set Screw & Mfg. Co., Bartlett, Ill.

## New Metal Processing Bulletin

Metal Processing Bulletin 57-108, 8 pages, 2-colors, gives full information on infrared ovens and components for metal processing applications. Typical installations are shown. For free copy, write Dept. MPM, Fostoria Corporation, Infrared Div., Fostoria, Ohio.

## Design Booklet on Nonferrous Metal Powder Parts

A new booklet under the title, "Designing for Pressed Brass and Nickel Silver Metal Powder Parts", has been prepared and published for design engineers and manufacturers considering the use of nonferrous structural parts in the production of consumer and industrial products. The first section of this new booklet contains much useful information on the powder metal process and its uses in modern production techniques. Consideration is given to compositions and properties of nonferrous alloys, commercial tolerances, practical design suggestions and elements affecting costs. The applications section contains pictures and case history information on twenty-seven selected examples showing the uses of brass and nickel silver metal powder parts in many different types of products. Details are given with each example that will be of help to designers in many fields of manufacturing. Write Dept. MPM, Market Development Div., The New Jersey Zinc Co., 160 Front Street, New York 38, N. Y.

## Psychrometric Chart

New edition of the Ross Psychrometric Chart is now available, upon request, at no charge. This expanded chart now goes to 350°F. Dry Bulb Temperature. Write Dept. MPM, J. O. Ross Engineering Div., Midland-Ross Corp., 730 Third Avenue, New York 17, N. Y.

## Miniaturized Toggle Clamps

"Tiny Toggle" and miniaturized clamps are described in Bulletin #102105. Featured are De-Sta-Co Series 102, miniaturized, vertical-handle toggle clamps, and an improved De-Sta-Co Series 105 horizontal-handle "Tiny Toggles." Prices and complete specifications for each series is listed. Full size tracing templates are also included. Write Dept. MPM, Detroit Stamping Co., 340 Midland Avenue, Detroit 3, Mich.

## Assembly Cost Savings

A colorful new brochure which depicts a variety of interesting assembly-cost savings case histories is now available. One case history, for example, shows how a large air conditioner manufacturer was able to replace 10-weld-type fasteners with just six standard Speed Nuts for assembly cost savings of 80 per cent. Another case history shows how an automobile manufacturer was able to achieve a savings of 40 per cent in material costs and 12 per cent in assembly costs with a single engineered Speed Nut designed to replace five separate parts. For free copies of the new brochure, write W. H. Gibbons, Dept. MPM, Tinnerman Products, Inc., P. O. Box 6688, Cleveland 1, Ohio.

## Bulletin On Finishing Systems

This bulletin describes this company's integrated line of finishing equipment. It provides typical finishing system applications and specifications. Write for MOCO bulletin, Dept. MPM, Michigan Oven Co., Finishing Equipment Dept., 423 Brainard, Detroit 1, Michigan.

## Facilities Brochure

This brochure describes this companies facilities which include plants for the manufacture of rolled and extruded products, sand and permanent mold castings, die castings, and fabricated assemblies. Complete facilities for manufacture and processing of magnesium and aluminum. Write Dept. MPM, The Dow Metal Products Co., Midland, Mich.

## Heat Processing Equipment

This bulletin presents a brief resumé, representing a cross-section of some of the many installations and products manufactured by this company. Industrial ovens of all types are included. Write Dept. MPM, Drying Systems Co., 1800 Foster Ave., Chicago 40, Ill.

## Stainless Steel Tubing

A new booklet on stainless steel tubing is now being distributed. More than 25 tables on stainless steel tubing are included, along with photographs and other drawings and data. A special section on composite tubing is also included. A copy of the booklet, "Allegheny Ludlum Stainless Steel Tubing" can be obtained by writing to Dept. MPM, Advertising Dept., Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.

# MPM

## new supplies and equipment

### Airless Spray Gun

An airless spray, called the H-Gun, operates from a conventional airless system, and is said to provide a spray pattern with full feathered edges and balanced material distribution. The gun, served by the standard HydraAirless-20 system, will spray first quality lacquer, varnish, and enamel work, according to the manufacturer. It may be used for wide or narrow patterns, in small enclosures, and for all types of metal and wood products without "pigtails" or flooding.

Hammertone finishes, as well as conventional vinyls, oil base, and red lead materials, may

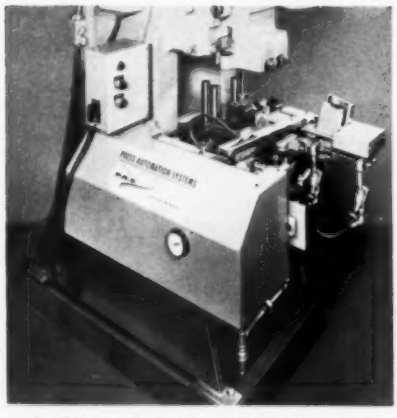
all be sprayed, the manufacturer states, with substantial improvement in quality and material savings.

For further information, contact Dept. MPM, The Spee-Flo Co., 6614 Harrisburg Blvd., Houston 11, Texas.

### Packaged, Plug-in Feeder Unit for OBI Presses

A standard, packaged plug-in feeder unit that automates open back inclinable presses to promote safety and increase production of small stampings is now available. Called the PAS-IT feeder, the unit is said to feed parts into dies at rates of from 40 to 60 pieces per minute.

The feeder unit mounts on the side of a press. It transfers parts to the die from an operator-fed,

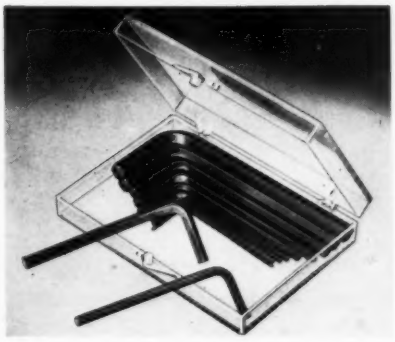


preload station located out of the die area. The parts are removed from the die by air rejection or other type of automatic unloading means.

For further information, contact Dept. MPM, Press Automation Systems, Inc., 25418 Ryan Rd., Warren, Mich.

### Hex Keys for New Type Cap Screws

Two new hex keys for the new 1960-type cap screws which replace the 36 Series have been introduced. The two additional keys are required for cap screw sizes 6 and 8, which have both been changed in the socket dimensions. The keys are made of alloy tool steel and isothermal heat treated for maximum strength



without brittleness, according to the manufacturer. Key sizes are 7/64 inch and 9/64 inch, and are available as a part of a set of eleven boxed in a plastic container.

For further information, contact Dept. MPM, Set Screw & Mfg. Co., Bartlett, Ill.

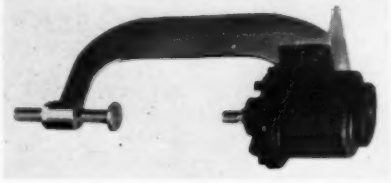
### Industrial Arc Welding Machines

A line of Murex ac industrial arc welding machines in 200 to 500-ampere capacities, for heavy duty production welding, has been announced. Designated Types M20 to M50, these units are designed to NEMA standards, and provide optimum arc characteristics and stability over a wide variety of electrode types and sizes.

For further information, contact Dept. MPM, Metal & Thermit Corp., General Offices, Rahway, N. J.

### Air-powered "C" Clamps

Two lines of clamps, a heavy duty series for strength and durability, and a low cost economy series for average applications, are now available. The clamps are equipped with a manual sleeve valve or with an integral solenoid valve for automation applications. Various power factors



are available, and all clamps come furnished with a number of optional clamping ends.

For further information, contact Dept. MPM, Airmatic Valve, Inc., 7313 Associate Ave., Cleveland 9, Ohio.

### Quick Release Fastener

Cam-Bolt, a special fastener for use where the strength of a bolt is required, yet where fast opening and closing is desirable, has been announced. The bolt, now in use on missile and engine containers, maintains a constant, leak-proof seal of any predetermined pressure. A single adjustment made at the time of installation insures the proper sealing pressure without use of a torque wrench or further tests or adjustments.

For further information, contact Dept. MPM, Simmons Fastener Corp., North Broadway, Albany 1, N. Y.

### Anodizing Process for Aluminum

A completely new anodizing process which creates a wide range of lasting colors has been introduced. The process is said to produce a superior anodic coating with a broad variety of colors and a high degree of color stability and uniformity.

Called Kalcolor,* the process results in distinctive colors that do not come from use of organic dyes. Instead, lasting tones are created during the process through conversion of alloying elements within the metal itself. Colors include gold, amber, tan, brown, olive, gray, and black.

For further information, contact Dept. MPM, Kaiser Aluminum & Chemical Sales, Inc., Department NR-42, 300 Lakeside Dr., Oakland 12, Calif.

* Trademark, Kaiser Aluminum & Chemical Corp.

### Variable Speed Drives

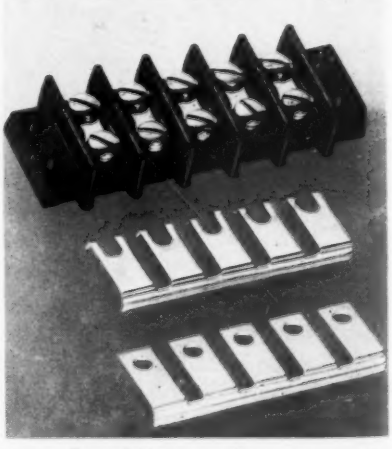
The 400 Series Zero-Max variable speed drives, recently introduced, feature built-in overload protection and a new control for fast

and precise speed setting. Other features include a larger input shaft on the smaller models for easier adaptation of pulleys and accessories, wider mounting pads, and double slotted holes for greater stability and easier alignment.

For further information, contact Dept. MPM, The Zero-Max Co., Minneapolis, Minn.

### Jumper Strips

Ready-to-use jumper strips for faster, better connections are now available. They eliminate the need for the usual series of jumpers between terminal stations on multiple adjacent station connections. Type RJ jumper has closed-type connecting lugs with holes sized to accept 6-32



screws. Type RJS has spade-type connecting lugs requiring merely loosening of terminal screws to insert.

For further information, contact Dept. MPM, Kulka Electric Corp., 633-643 S. Fulton Ave., Mt. Vernon, N. Y.

# Looks like leather!
# Wears like iron!

*Actual-size photograph shows grain-like look and unusual flexibility of new SURE-TUF finish.*

## Amazing New LOWE BROTHERS SURE-TUF™ finish

***...bakes on, dries tough, won't crack, gives metal products a "new look" that builds sales***

The close-up photograph here only gives you a hint of how new Lowe Brothers SURE-TUF really looks. You need actual samples of black and colors to judge the rich appearance, the "leather-grain" depth, the unusual durability and bendability of this easy-to-work baked-on enamel finish. Write today. Tell us to rush samples with information—or to send a Lowe Brothers finishing engineer to visit you for a first-hand discussion of how SURE-TUF can improve your metal products.

**LOWE BROTHERS**
**INDUSTRIAL FINISHES**

QUALITY UNSURPASSED SINCE 1870

*Style-tested paints for Home and Industry*

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Chicago, Ill. • Boston, Mass.
Jersey City, N. J. • Cleveland, Ohio
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MPM-5

☐ Please have my nearest Lowe Brothers Finishing Engineer call on me as soon as possible.

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set your line with extra sales bait

# TI-CO® NON-FLAKING GALVANIZED SHEETS

## *for* CORROSION RESISTANCE

*Anywhere there's a corrosion problem . . . there's a place for INLAND TI-CO!* More and more, makers of famous-name appliances, producers of farm equipment, manufacturers of thousands of products which must withstand moisture-laden atmospheres, in or out-of-doors, are recognizing non-flaking TI-CO as the standard of excellence in galvanized sheets. ■ TI-CO galvanized sheets keep your product components functioning longer and add years to the appearance of the finished product . . . giving consumers greater value and adding "sales bait" to your product line.

**INLAND STEEL COMPANY** 30 West Monroe Street • Chicago 3, Illinois Sales Offices: *Chicago • Davenport • Detroit Houston • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul*

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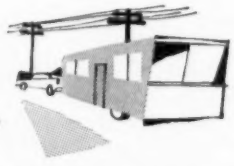


***TI-CO protects families, too, in modern house trailers. Thousands of these compact, mobile homes have roofs made of this non-flaking galvanized sheet.***

***Years of corrosion-resisting service are added to washers, dryers, refrigerators and other appliances whose parts are made of non-flaking TI-CO.***

***Poultry feeders and other farm equipment subjected to weather and abusive chemicals last longer when made of non-flaking TI-CO.***

## Three Appliance Firms Report Earnings Gains

Admiral Corp. and White Sewing Machine Corp. have reported substantial sales and earnings gains for 1959, and Fedders Corp. has announced similar gains for the first half of their fiscal year.

Admiral's consolidated net sales in 1959 were $199,605,609, 17 per cent higher than 1958 sales. According to the company's annual report to shareowners, consolidated net income increase to $4,-108,450, or $1.7 per share on 2,405,471 shares outstanding.

Admiral also announced a $1 million expansion program at Harvard, Ill., which the company says will result in the largest single television plant in the world when the facility is completed in June.

White Sewing Machine Corp. reported a full year of profit for the first time in several years due to "substantial overall improvement" in its 1959 operations.

According to a company statement, all of the divisions operated profitably during the year, even though profit in some divisions was less than anticipated due to the steel strike. Gains in 1959 raised consolidated corporate sales to $28,216,-420, 3.5 percent greater than those of the previous year. Corporate earnings were $613,835, a net improvement of $2,-094,923 over the 1958 loss of $1,481,-088, before tax loss carry back.

Sales and earnings of Fedders Corp. for the fiscal first half ended February 29 were materially above those for the corresponding period of the preceding year. Earnings for the six months exceeded those for the entire three quarters of fiscal 1959.

As had been anticipated, a company spokesman said, sales of room air conditioners for the three months ended February 29 were affected by the extremely high level of shipments that occurred during the preceding three months.

## Japanese Visit Cole Steel

A team of 12 Japanese businessmen recently toured the factory of Cole Steel Equipment Co., York, Pa., manufacturer of office equipment.

The group, composed of proprietors and factory managers of medium and small Japanese office equipment firms, inspected Cole's plant facilities, manufacturing methods and overall production schedule. The tour was arranged by the International Cooperation Administration, an agency of the U. S. State Department, as part of a five-week program to give the Japanese industrialists a thorough knowledge of the office equipment industry in the United States.

## Waste King Forms Service Div.

Waste King Universal has announced the formation of a customer service division to direct a nationwide network of more than 450 franchised agencies and five company-owned operations trained to service all household and commercial appliances manufactured by the company.

Robert Clark, general service manager, heads the division's national staff of 125, composed primarily of personnel previously with the Waste King or Cribben and Sexton service divisions.

Responsibilities of the service division include management of the product warranty program; product analyses; coordination of field service activities; production of service training programs, bulletins, film aids, and product repair manuals; and organization of inventories for use across the country.

## Two Firms Announce Plant Expansions

Plant expansions have been announced by Armco Drainage and Metal Products, Inc., and In-Sink-Erator Mfg. Co.

The addition to the Middletown, Ohio, steel building manufacturing plant of Armco Drainage will consist of a new building and new forming and punching machinery for the manufacture of newly engineered steel purlins — a type of roof joist. The additions are expected to cost $440,000.

The purlins, which will be used in the company's new line of steel buildings, will be produced and painted on a continuous production line.

In-Sink-Erator, Racine, Wis., producer of garbage disposal units, plans a $1 million expansion within a year or two. The program involves construction of a 125,000-sq.ft. plant and office, replacement of equipment, and purchase of new units.

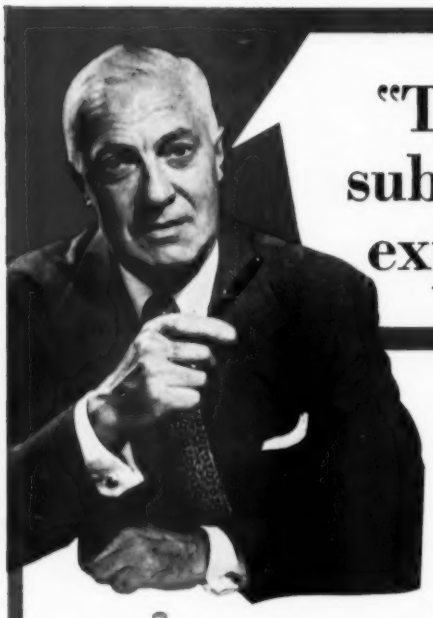
## GE Develops New TV Camera

General Electric Co. has developed a self-contained, single-unit transistorized camera designed to function at top effi-

*to Page 105* →

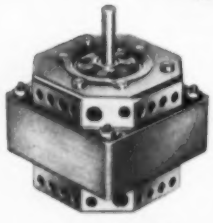
## MPM's Mrs. Home Laundry Queen Honored at Speed Queen

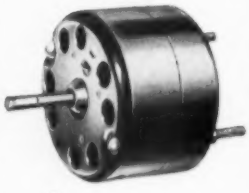
*Virginia Haberman, 1960 Mrs. Home Laundry Queen, receives letter from MPM editors notifying her of her prize — a Speed Queen washer and dryer. Virginia's selection as the fourth Mrs. Home Laundry Queen was announced in the April issue of MPM. Looking on (left to right) are Reg James, Speed Queen vice president and director of sales; President Jack Murray; and Virginia's husband, Larry.*

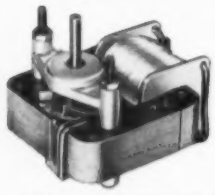


"There's no substitute for experience"

*During the past 40 years General Industries has produced millions of electric motors for users throughout the world . . .*







It's literally true that any device or machine is only as good as the motor that powers it. That's why leading manufacturers around the world prefer to rest their reputation on GI Smooth Power motors. They know that with 40 years' experience in designing and building sub-fractional hp motors for every requirement, GI can be counted on to produce the best motor for the job, at the lowest possible price. Next time *you* have to make a decision on a motor, remember, "There's no substitute for experience." Specify GI motors: quality-proved, millions of times over!

*Smooth Power*

AC MOTORS 1/1800 H.P. TO 1/35 H.P.
TO MEET EVERY REQUIREMENT
*Catalog Available on Request*

MAIN PLANT: ELYRIA, OHIO
Conveniently located 25 miles west of Cleveland on the main line of the New York Central Railroad, and 16 miles from Cleveland airport.

Other General Industries' plants:
- Belleville, Ohio
- Marysville, Ohio
- Bald Knob, Arkansas
- Putnam, Connecticut

THE GENERAL INDUSTRIES CO.

DEPT. GF • ELYRIA, OHIO


## Editor's mail

→ *from Page 23*

### Me too

Gentlemen: Re March, 1960 issue of MPM, ditto to De Wayne Thomas' request for information on standards for testing products with a vibration table.

**R. A. Van Stee**
**Director of Quality**
**American Motors Corp.**
**Kelvinator Div.**
**Grand Rapids, Mich.**

Mr. Thomas' request appeared in the Editor's Mail column of last month's MPM. Both requests have been fulfilled.

The Editors

### Heat pumps

Gentlemen: I read with interest the article on heat pumps in the February, 1960 issue of Metal Products Manufacturing. Would you kindly mail us a reprint of the article.

**L. G. Spielvogel**
**Valley Engineering Co.**
**Glenside, Pa.**

### MPM design selection earns English "outstanding achievement"

Gentlemen: We thought you might be interested to hear that the "StarMix" electric blender-mixer designed by Goertz Industrial Design, Inc., and featured in the August issue of Metal Products Manufacturing, was selected as one of "the outstanding achievements in design for 1959" by the English magazine *Design* in its January, 1960 issue. As you probably know, *Design* is a monthly magazine published for the English Council of Industrial Designers and its Scottish Committee. In this issue, eighteen products were chosen. Six were manufactured in the U. S. A., four in Germany, two in Japan, and one each from Sweden, Belgium, Australia, South Africa, Norway, and Denmark. We, of course, were very pleased to see the mixer receive this international recognition.

**E. Betty Berry, Business Manager**
**Goertz Industrial Design, Inc.**
**139 E. 57th St., New York, N. Y.**

### Change of address

Gentlemen: Received the attached form a few weeks back, and simply want you to know that I find the magazine you sent me to be of tremendous interest and, in many cases, very helpful.

I certainly want to continue to receive it. We will have an address change in the near future, and I wonder if, starting May 1st, you would see that this magazine is sent to: J. K. Storkman, American Nickeloid Co., 1001 Franklin Ave., Garden City, Long Island, N. Y.

**J. K. Storkman**
**American Nickeloid Co.**
**1001 Franklin Ave.**
**Garden City, L. I., N. Y.**

## Industry news

→ *from Page 103*

ciency under extreme conditions of vibration and noise.

The closed-circuit TV camera is said to have wide application in the military, industrial and educational fields.

### "Shocking" Colors Predicted

Hyacinth, regimental red, geranium pink, bristol blue, slate blue and espresso (blackish-brown) might seem too "shocking" for today's appliance colors, but they may be typical of appliance colors in the future. Beatrice West, New York color stylist, made the prediction in a forecast prepared for Caloric Appliance Corp.

The current pacesetters in appliances colors, according to Miss West, are copper, wood tones and stainless steel, with turquoise, pink and yellow continuing their popularity. The basic white appliance is far from obsolete, she added. The wide assortment of colors available for walls, countertops and floor coverings can be used with white appliances to create distinctive fashionable effects.

### Temco to Build Shelters

Temco Industrial Div. of Temco Aircraft Corp. has signed a contract to manufacture a large quantity of "little school houses" to keep children out of the weather while waiting for the school bus.

The contract, valued at more than $1,500,000, provided that Temco Industrial will begin production shortly at the Grand Prairie and Garland facilities. The buildings, built for Roadside School Houses, Inc., will be made of corrugated aluminum.

### Lennox Holds Manager Meeting

The application of industrial and commercial heating and cooling was the chief subject of a recent two-day meeting in Marshalltown, Ia., of 36 territory managers of Lennox Industries, Inc. The territory managers will transmit the new information on products and methods directly to engineers and architects as well as to approximately 1,500 Lennox midwest division dealers.

### 3 Freezers, 2 Refrigerators Introduced by Admiral

Three new freezers and two new Dual-Temp refrigerator-freezer combinations have been introduced by Admiral Sales Corp.

According to B. L. Stahlschmidt, sales manager-freezers, "Pricing of the special chest freezer will enable appliance dealers to compete successfully with the chain stores, mail order houses and direct-selling manufacturers." The freezer Stahlschmidt referred to is a 15.3-cu. ft., chest model that can be sold as low as $199.95.

The low-priced model features a fast freezing compartment with a capacity of 3 cu. ft., a counterbalanced lid, a door lock, and new thin-wall construction incorporating fiberglass insulation.

A deluxe step-up model is also offered. It includes an additional removable frozen storage basket, protected interior light, and a warning signal light that turns off automatically if the freezer should need attention. A 16.2-cu.-ft. upright freezer also has been introduced as a matching unit for the two new Dual Temp refrigerators. It has a capacity of 539 pounds of frozen food and is rated large enough for a family of six to eight persons.

The two new refrigerator-freezer combinations have been introduced as "spring specials." One is a two-door 14.7-cu.-ft. Imperial Dual-Temp, and the other is a 14.9-cu.-ft. two-door upside-down version.

Both units feature a moist-cold fresh food compartment, magic ray lamp that prevents foods from trading flavors,



**Hooks, racks, or "rejects" stripped clean of paint in 5 seconds to 4 minutes!**

Now you can abandon costly hit-or-miss methods of paint stripping. Install a Kolene unit to place the paint stripping operation in its proper relationship to other modern operations in your plant. Engineered by us for batch cleaning (shown above), or for continuous, fully automatic conveyor systems. Clean, safe and easy to operate, the Kolene process conserves man hours and materials, strips large or small hooks and racks clean in 5 seconds to 4 minutes! Strips rejects clean for repainting in a matter of seconds! *Used by leading manufacturers!* Write for details!

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LEADER IN SALTBATH CLEANING
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NOTE: As a customer service, Kolene operates a jobbing division. Ship parts for process evaluation.

KOLENE CORPORATION
12890 Westwood Ave. • Detroit 23, Mich.

three glide-out shelves, twin porcelain crispers and a special meat keeper.

## National Rejectors Builds Hot Springs Plant

The construction of a new manufacturing plant at Hot Springs, Ark., has been announced by National Rejectors, Inc., a wholly-owned subsidiary of Universal Match Corp.

According to John L. Wilson, chairman of the board of National Rejectors, the new facilities are being built to meet the increased demands for the firm's coin handling equipment.

## Lead Industries Association Holds 32nd Meeting

Members of the Lead Industries Association, who attended the organization's 32nd Annual International Meeting in St. Louis recently, heard lead described as a "modern" metal playing a vital part in today's technology.

Dr. Schrade F. Radtke, head of the LIA research program, reported that important new markets for lead ranged from sound attenuation to exotic chemical compounds. These fields have already begun to use significant amounts of lead, he said, and both basic and applied research are being pursued throughout the world to further utilize the metal.

Robert L. Ziegfeld, secretary, told the association that research, both basic and applied, will keep the per capita consumption of lead increasing as it has during the past decade.

## Sweeper-Scrubber Developed

A new electric cleaning appliance for vacuuming carpeted and bare floors and for scrubbing all hard floor surfaces has been announced by Bissell, Inc. The key to the new idea is a power unit handle which is used interchangeably with the two cleaning attachments.

The Bissellectric Sweep Master is said to be a compact, lightweight unit for cleaning all types of floor surfaces. The Scrub Master attachment releases clean water and special cleanser, scrubs the floor, and vacuum-dries the floor instantly. The tank on the scrubber holds enough water and cleanser to clean a 12 x 20-foot area without refilling.

## Robert S. Thompsen Named PEI Technical Manager

Robert S. Thompsen has been named manager of technical activities of the Porcelain Enamel Institute. He will act as staff representative for PEI's technical programs, serving as secretary and coordinator for the shop practice forum, processing committee projects, quality development programs, and related activities.

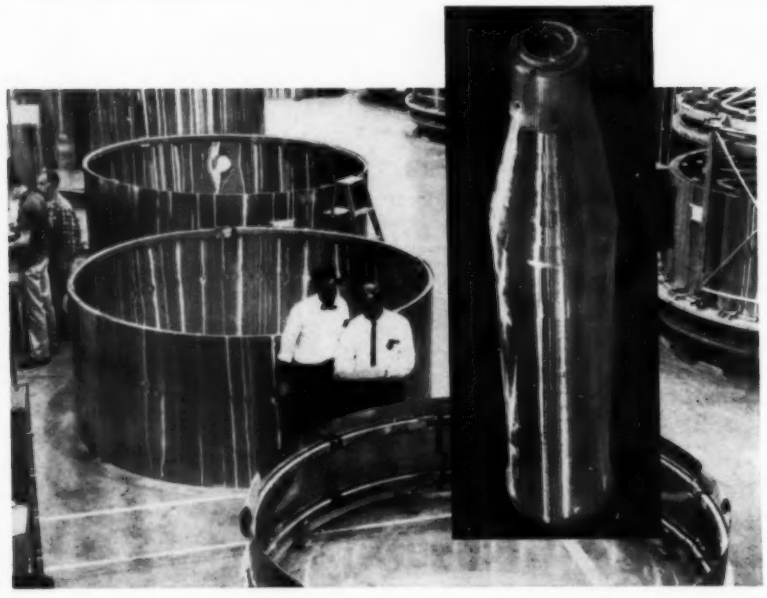
Thompsen is a ceramic engineering graduate of Virginia Polytechnic Institute. Since graduation in 1951 he has served as an Air Force officer at Wright Air Development Center, and as a product development engineer with Firth Sterling, Inc. For the past four years, he has been employed by Babcock and Wilcox in various engineering capacities.

## Whirlpool Range Shipments Reach New Monthly High

Factory shipments of RCA Whirlpool ranges have reached record proportions for the second consecutive month. The company reported that units shipped to distributors in February broke the existing record established in January by 10 per cent. January shipments had exceeded the previous high set in July 1956.

During the last week of February, sales to dealers matched the peak week of 1959, which was in September. Fac-

*to Page 110* →

**"the life of an ATLAS tank section begins in the town of Washington, Pa.**

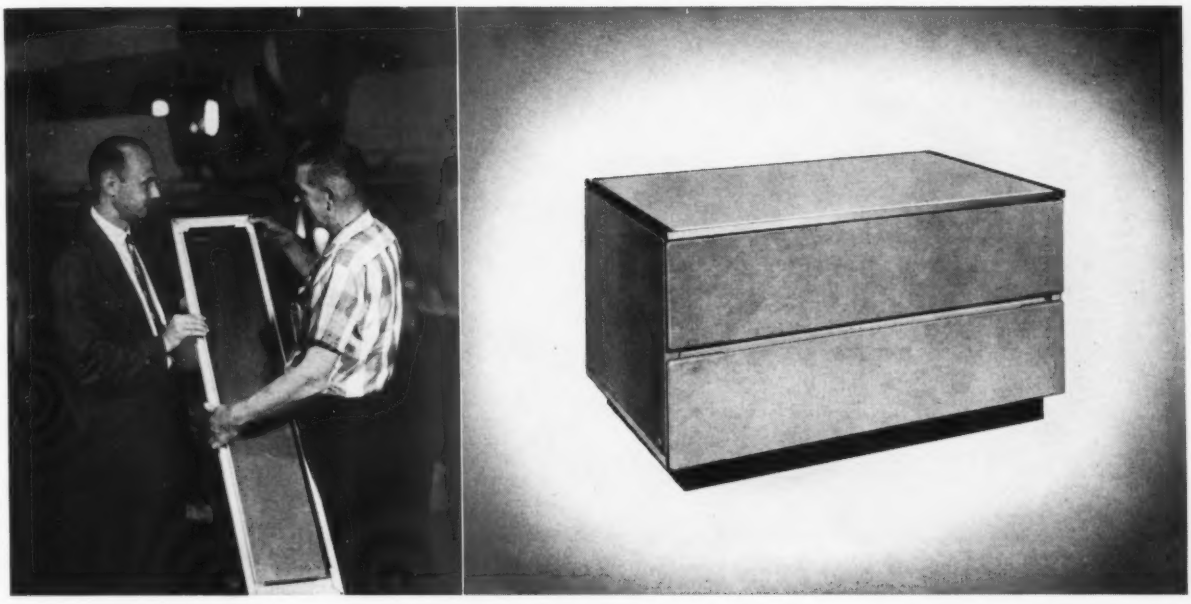
**. . . where the Washington Steel Corporation produces thin-gauge Stainless Steel in long, flexible bands about a yard wide."***

Washington Steel Corporation is the exclusive supplier of stainless skin for the ATLAS program for a very good reason: it has been able to meet the exacting specifications laid down for this specific undertaking.

Washington Steel Corporation is the pioneer in precision-rolling of light gauge stainless sheets by the Sendzimir process.

*ATLAS—The Story of a Missile
*by John L. Chapman,* ©1960

WASHINGTON STEEL CORPORATION
5-G WOODLAND AVENUE WASHINGTON, PA.



# Store fixture with customer-proof durability made of Clad-Rex® vinyl-clad metal

■ This island table, a combination counter and four-drawer storage unit, has proved its unusual durability in the busy aisles of one of the nation's largest chain of stores (name on request).

The reason—drawer fronts and side surfaces are made of Clad-Rex vinyl-clad metal. Where paint finishes chip and wear, Clad-Rex is virtually scuff-proof—practically maintenance-free! And there's styling, too—almost unlimited in color, texture and print! Jack Cannon, Plant Manager at Morton, says Clad-Rex "is no more difficult to fabricate than *un*finished metal".

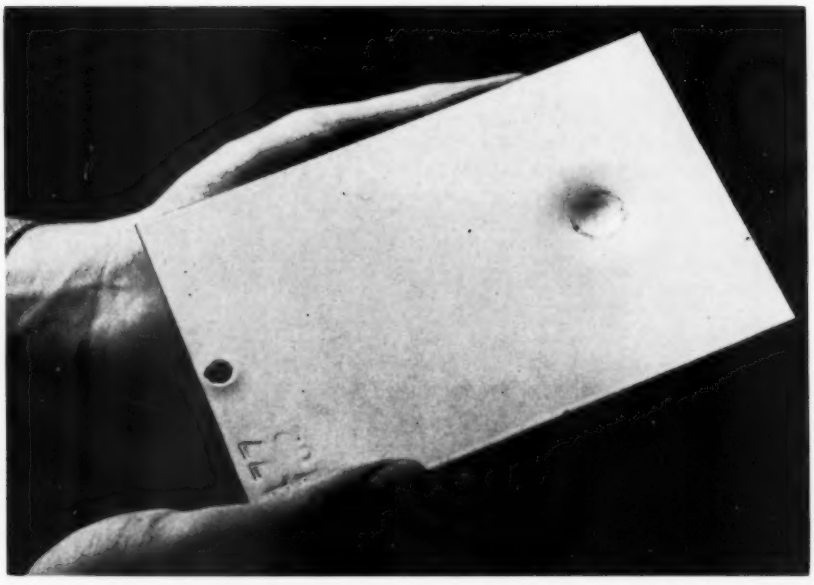
See for yourself how *all* the other advantages of Clad-Rex vinyl-clad metals can improve both your product and production operations. Write today. No obligation, of course.

VINYL-METAL LAMINATES BY **CLAD-REX**® DIVISION OF SIMONIZ COMPANY

**2127 Indiana Avenue • Chicago 16, Illinois**

**Telephone: VIctory 2-7272**

17-B



*This sample of Armco Univit enameling iron was porcelain enameled with a single coat of white enamel applied directly on the metal with only one firing. Bond is shown here after a* PEI *adherence test.*

# Armco announces Univit enameling iron for one coat direct-on

UNIVIT IS A RIMMING GRADE of enameling iron developed by the research laboratories of Armco Steel Corp. for direct application of a single porcelain enamel finish coat in one fire.

The properties of this new grade, coupled with techniques recently developed by enamelers to improve finish coat bond adherence, now make this application an economic possibility for production work, according to the producer. Enameling cost is reduced by eliminating the blue ground coat. Total enamel thickness is reduced, which indicates greater resistance to mechanical damage. U. S. and foreign patents have been issued covering this product.

### No boiling or fishscaling

Armco researchers report that Univit assures freedom from boiling and fishscaling of the porcelain enamel, thus solving two of the major problems associated with one-coat work. Of particular importance is the fact that, with enamel fishscaling controlled, a wider range of enamel adhrence is possible.

The new product is available in 16 through 24-gauge, in widths from 30 inches to 50 inches, and in cut lengths up to 145 inches. It can be purchased in commercial and drawing qualities.

### Preparing the surface

Univit is not mill processed to prepare the surface for tighter bond. Development of enamel adherence is the responsibility of the enameler.

Many enamelers who have done work with one coat processing know that a standard metal preparation (alkali cleaner, sulphuric acid pickle, and nickel flash) may not promote the minimum bond requirement for applying a finish coat directly on the metal. A great many variations in cleaning and pickling have been tried to achieve better bond. With the hazard of enamel fishscaling eliminated, several techniques have been successful.

### Drawing, forming, welding and metal finishing

Precautions must be taken to prevent scratches and burrs when drawing. forming and shearing. Since only one thin coat of porcelain enamel is applied, burrs, gouges or scatches will not cover satisfactorily as they might in conventional two-coat practice. Normal die practice and moderate care in handling should prevent these difficulties.

When mill-processed for the intended part, drawability is reported as similar

*to Page 127* →

THE HOUGHTON LINE

COOLANTS FOR METALWORKING

HYDRAULIC FLUIDS AND PACKINGS

CLEANERS

RUST PREVENTIVES

QUENCHING OILS & HEAT TREATING SALTS

DRAWING COMPOUNDS

SPECIALTY LUBRICANTS

ON-THE-JOB SERVICE

HPW

# NEW

CPW

# NEW

*The forgings you see here are about to get the cleaning of their life in Houghton's new CERFA-KLEEN HPW . . . one of two new Cerfa-Kleens designed specifically for faster and more efficient production line power washing.*

# Cerfa-Kleen

## METAL CLEANERS

### for *power washers—hot or cold*

Whether you use power washers, soak tanks, or mechanical cleaning processes, there's a brand new Cerfa-Kleen job-tailored to (1) clean faster and better (2) to be easier and safer to use and (3) to give you EXTRA benefits such as built-in rust preventives, water softeners, non-foaming and free rinsing characteristics when you want them. Best yet, you don't have to pay for special formulations when there's a Cerfa-Kleen to handle most cleaning jobs.

**For Hot Power Washing**


A new, more powerful hot spray cleaner with built-in rust protection. Contains Houghton's Rust Veto M.P., a multi-purpose water soluble rust preventive which leaves an imperceptible but effective and long-lasting film on work after soil has been completely removed. Dissolves readily and provides a strong, bi-phase detergent action. Non-foaming, non-caking, free-flowing and non-caustic. Contains no free caustic. Recommended for heavily soiled ferrous metals, for aluminum and most non-ferrous applications.

**For Cold (room temp.) Power Washing**


A highly effective formulation of fast-dissolving mild alkalies that work at room temperature and save heating costs. Features a built-in water softener and rust preventive. Like all Cerfa-Kleens, CPW is non-caking, non-dusting, free-flowing with no free caustic. It combines all bi-phase solvent alkali cleaning with non-foaming organic detergency boosters to help remove soil that's stuck tight. Non-corrosive and non-staining on aluminum, copper or brass. Recommended for removing cutting and grinding oils, light drawing or stamping compounds and similar oil-type contaminants.

For details about Houghton's new Cerfa-Kleens, or our full range of industrial metal cleaners, call your Houghton Man today, or write: E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

**Industry's Partner in Production**

**E. F. HOUGHTON & CO.**

**Philadelphia, Pa. • Chicago, Ill. • Carrollton, Ga. Detroit, Mich. • San Francisco, Calif. • Toronto, Canada**

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tory shipments the first two months of this year rose 83 per cent from the corresponding 1959 period.

## Hotpoint Announces New Appliance Service Plan

A new appliance service policy adopted by Hotpoint Div., General Electric Co., eliminates all hourly labor charges and reportedly reduces charges for house calls up to 50 per cent.

The new plan is based on a "one charge" system for repair, replacement, or adjustment of kitchen-laundry appliances. Other benefits of the plan, according to the company, include a 60-per cent reduction in service costs complaints; the elimination of charges for calls back in case no one is home; if service call is cancelled, or special parts have to be ordered; exact quotations of cost before repair work is performed; and increased servicing efficiency to the customer.

More than half of Hotpoint's service is performed by servicing dealers or independent service agents. However, in metropolitan areas, most dealers prefer to have Hotpoint perform its own service, as other appliance manufacturers do.

The new service program will be made available to all servicing dealers who can adopt it to fit their local marketing conditions.

The core of the new system is a job pricing manual which lists charges for the three service categories: replace, repair, or adjust. Charges range from $1.45 for replacing a water heater cover to $42.75 to replace a complete electric range body.

This book eliminates complaints about the high cost of service, the company says. If the customer is wary about what the service charge will be, the serviceman can figure out the total cost before the work is performed. He shows the job pricing manual to the customer, thus assuring that the prices he is charging her are based on local prices, skills and pre-determined time needed to perform the job to her satisfaction.

Another feature of the new system is the "flat rate" charge for making a house call. Previously, prices varied for a serviceman to make a house call — some areas ran as high as $10 for a house service call. Under the new system, there is one single flat charge, regardless of the time of the call or the distance a serviceman has to travel.

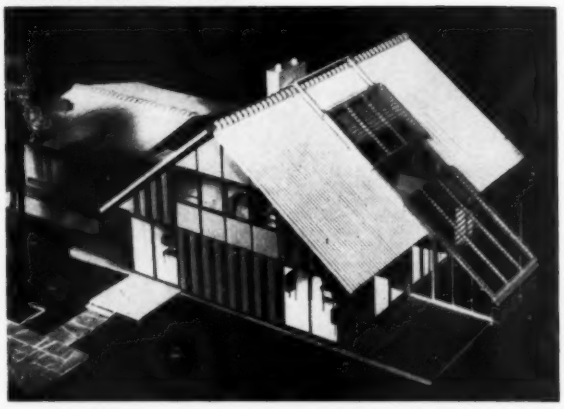
Hotpoint guarantees labor for 30 days and parts for one year.

Continuous checks on servicemen are another key part of the system. When they have too many calls back they are sent back to school for training on those weak areas.

Maintenance of customer satisfaction is also checked. Surveys are made in 75 per cent of the cases by telephone to the customer; the remaining 25 per cent are checked by post card. These are usually done within a few days after service has been performed to gain an accurate appraisal.

The new system was tested by the company for four months. It has been adopted now by all of the Hotpoint districts, main and branch houses, which include a total of 47 cities.

## Ferro Corp. Erects Porcelain Enamel House



*Scale model of the Ferro porcelain enamel research house now being erected in a suburban community near Cleveland, Ohio.*

A porcelain enamel research house under construction by Ferro Corp. in a Cleveland suburb is designed to test many revolutionary ideas in residential construction. More than 20 major companies are cooperating in the project.

The house will be used to explore methods of adapting residential housing components to the techniques of mass production, as well as serving as a proving ground for advances in plumbing, heating and wiring systems. The roof, all exterior walls and all interior walls in the kitchen, bathroom and utility areas will be finished in porcelain enamel in a variety of colors and textures.

Ferro also announced a $255,000 expansion of the firm's research center facilities. The expansion will provide an additional 9,600 sq. ft. of office and laboratory space, and increase the center's research capabilities.

## Lease Plan For Verson

*Signing the agreement setting up a long-term lease plan for all presses and press brakes is Melvin D. Verson, vice president administration, (left) of Verson Allsteel Press Co. Looking on is Robert Sheridan, president of Nationwide Leasing Co., Chicago, which is underwriting the program.*

## Kelvinator Offers Scholarships

The George Romney Scholarships to the 1960 NARDA Institute of Management will be awarded to franchised Kelvinator dealers. The Institute is scheduled for August 7-13 at the American University, Washington, D. C.

The scholarships, named after American Motors Corp. President George Romney, include transportation, registration fee, tuition, study materials and room rental.

## GE Tyler Plant Adds Men

Employment at the Tyler, Texas, plant of the General Electric Air Conditioning Dept. has been raised to a record 750

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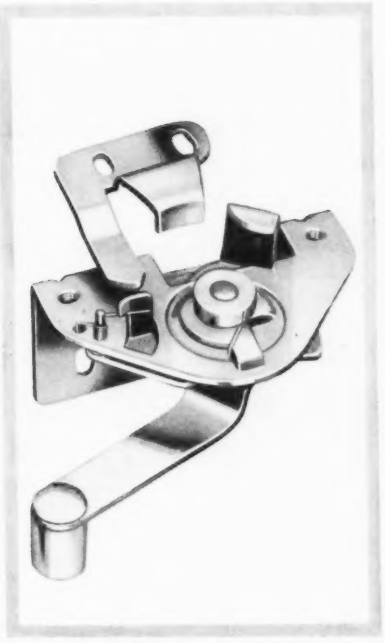

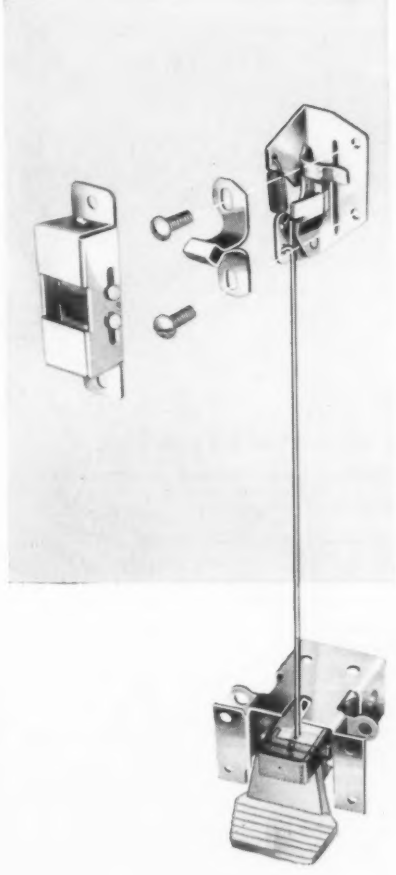

## Fresh Hardware Ideas Help You Sell!

Hardware ideas from Amerock help you put profitable extras into your products. Whatever your hardware needs . . . latch mechanisms . . . knobs and handles . . . hinges of all types . . . balancers . . . special devices . . . Amerock can provide an answer that incorporates your basic requirements of function, cost, and appearance. Choose one of thousands of stock items or utilize Amerock's Design Service to create exclusive new designs for you. Put our knowledge of your market to work for you today . . . use coupon for more about Hardware Ideas from Amerock.

**AMEROCK CORPORATION**
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Amerock

☐ Please send me your 1960 IDEA FILE.

☐ I would like to explore Design Service on hardware for_____

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☐ Have representative call.

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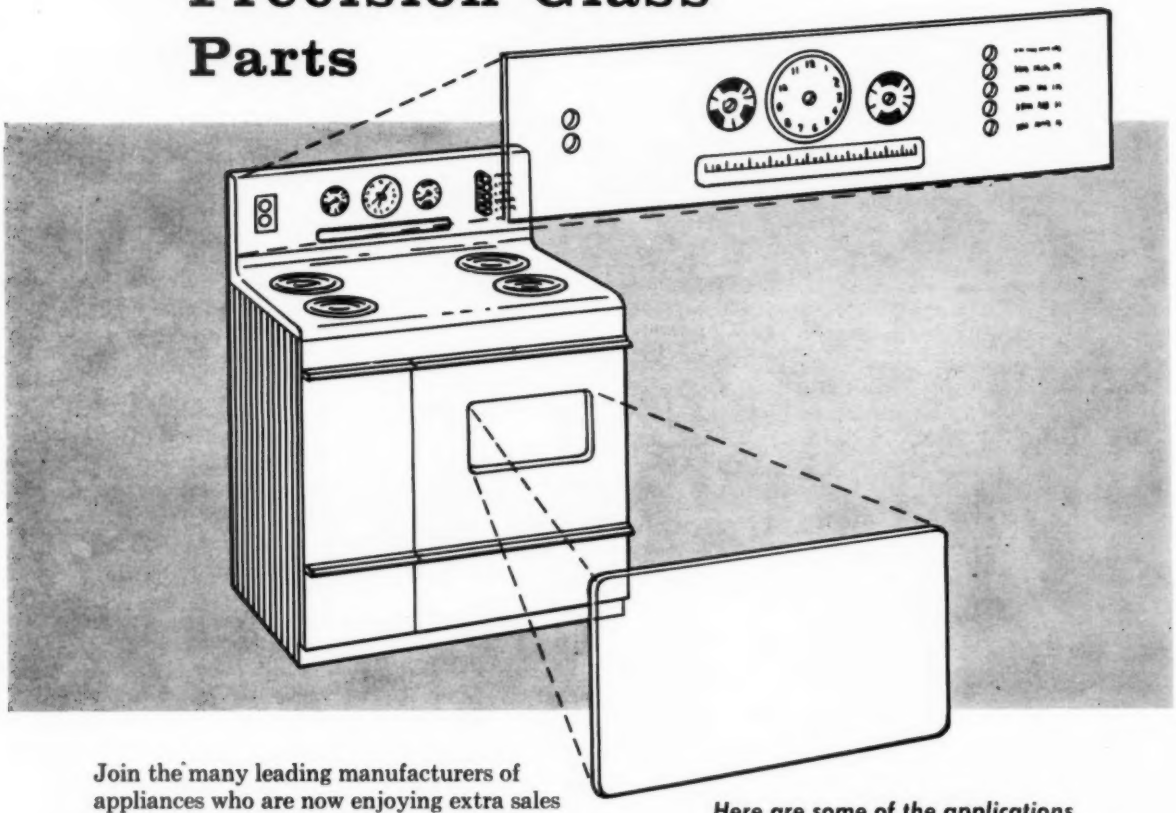
# MARSCO

## for the finest in Precision Glass Parts



Join the many leading manufacturers of appliances who are now enjoying extra sales from the appeal and prestige contributed thru the luster of glass. Glass will enhance the beauty and broaden the acceptance of your product. It can be hardened, heat-treated or tempered to survive consumer usage unscathed.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

***Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:***

- CLOCK AND TIMER CRYSTALS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- OVEN DOOR WINDOWS for both Conventional and Built-In Ranges
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- INSTRUMENTS
- MEDICAL EQUIPMENT
- LAMP GLASS
- SHELVING
- ROTISSERIES
- WASHING MACHINES
- DRYERS
- PEEP SIGHTS FOR WATER HEATERS

*Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.*

**ask for the man from**

*Marsco*

**MARSCO MFG. CO., 2901 S. HALSTED ST., CHICAGO 8, ILL.**

→ *from Page 110*

with the addition of 40 more production employees. The plant produces all of General Electric's central air conditioner and Weathertron units.

## Westinghouse Announces New Appliances

Two new remote air conditioning systems with nominal capacities of 10 and 15 tons and a new canister-type vacuum cleaner with a revolving air-drive brush to assure upright cleaner action have been introduced by Westinghouse Electric Corp.

The air-cooled air conditioning systems are said to be particularly applicable in large commercial installations such as supermarkets or industrial plants. They extend the present line of Westinghouse air-cooled remote air conditioning systems to a total of eight units in sizes from 2 to 15 tons.

According to the company, the Spinjet vacuum cleaner features a revolving brush cleaning device which operates entirely on air power. The user has two cleaners in one: upright action for rugs and carpets and canister convenience for all-purpose cleaning.

The canister, housing the universal-type motor, is mounted on a mobile platform engineered to prevent tipping. A fingertip suction control permits the user to increase or decrease suction quickly depending on the type of cleaning chore.

*Westinghouse Spinjet vacuum cleaner can be used as an upright cleaner or a canister model.*

## Design Engineering Show Expected to Draw 20,000

American manufacturers will get a glimpse of the products of the future when the Design Engineering Show, the largest exposition devoted to research and development, unveils a $10 million exhibit May 23. The show will run for four days at the Coliseum in New York, where it has been held only once before.

Twenty thousand engineers and company executives are expected to attend. Virtually every major manufacturing company in the country will be represented among the visitors. About 15,000 products, which go into the making of end products, will be shown.

Concurrently with the show, and also at the Coliseum, the machine design of the American Society of Mechanical Engineers will conduct a four-day conference. This year's papers will be concerned with the application of space-age design theory and techniques to new consumer products. Advances made in power, control, materials, computers, components and mechanics will be considered.

## Appliance Technical Conference Papers Announced

A complete schedule of technical papers to be presented at the 11th Annual Appliance Technical Conference has been announced by the American Institute of Electrical Engineers, sponsor of the conference.

The meeting will be held May 16 and 17 in the Mansfield-Leland Hotel, Mansfield, Ohio.

Two of the featured speakers will be B. A. Chapman, executive vice president of the Kelvinator Div., American Motors Corp., and R. E. Brooker, president of Whirlpool Corp. Chapman will discuss "Annual model changes vs. continual incorporation of significant technological advances," and Brooker's talk will concern the engineer's role in determining top-management policy.

The technical portion of the program will include the following papers:

**Session I**

"*Mechanical Problems of Electrical Contacts and Connections*," by L. W. Flenner, Therm-O-Disc, Inc.

"*The Importance of Electrical Connections in Automatic Appliance and a Practical Test for Determining Connector Reliability*," by K. M. Hammell, AMP, Inc.

"*Application of Motors to Major Appliances*," by J. C. Burdett, Westinghouse Electric Corp.

"*Preliminary Investigation of Ultrasonic Washing of Fabrics*," by L. A. Johnson, Westinghouse Electric Corp.

**Session II**

"*Standardizing Small Appliance Motors*," by E. D. Howell, International General Electric Co.

"*Immersible Coffee Maker*," by D. B. Price, Westinghouse Electric Corp.

"*Calibration and Quality Control Testing of Thermostats*," by W. C. Stevens, Jr., Stevens Mfg. Co.

"*Centrifugal Pumps for Appliances*," by V. K. Steidley, Gorman-Rupp Industries, Inc.

"*The Proportional Control — a Timerless Dryer Control System*," by N. Fuqua, Therm-O-Disc, Inc.

"*Refrigerator Control Systems*," by J. Libermann, Ranco, Inc.

"*Magnetic Door Closures for Refrigerators and Freezers*," by R. L. Bootes and J. B. Horway, General Electric Co.

"*Combining Microwave and Infrared Cooking in a Single Oven*," by S. C. Johnson, Westinghouse Electric Corp.

"*A Plug-Out Surface Cooking Unit*," by G. E. Price, Westinghouse Electric Corp.

"*An Automatic Surface Unit Control for Electric Ranges*," by C. J. Holtkamp, Westinghouse Electric Corp.

**Session III**

Conducted Tours

**Session IV**

Luncheon Tuesday

**Session V**

"*Thermoplastics in Appliance Design*," by G. Thayer, Dow Chemical Co.

"*The Flow Molding of Vinyl Plastisols*," by C. H. McFarland, The Scott and Fetzer Co.

"*A Hard Coating Process for Aluminum*," by J. J. Snegoski, Toro Mfg. Corp.

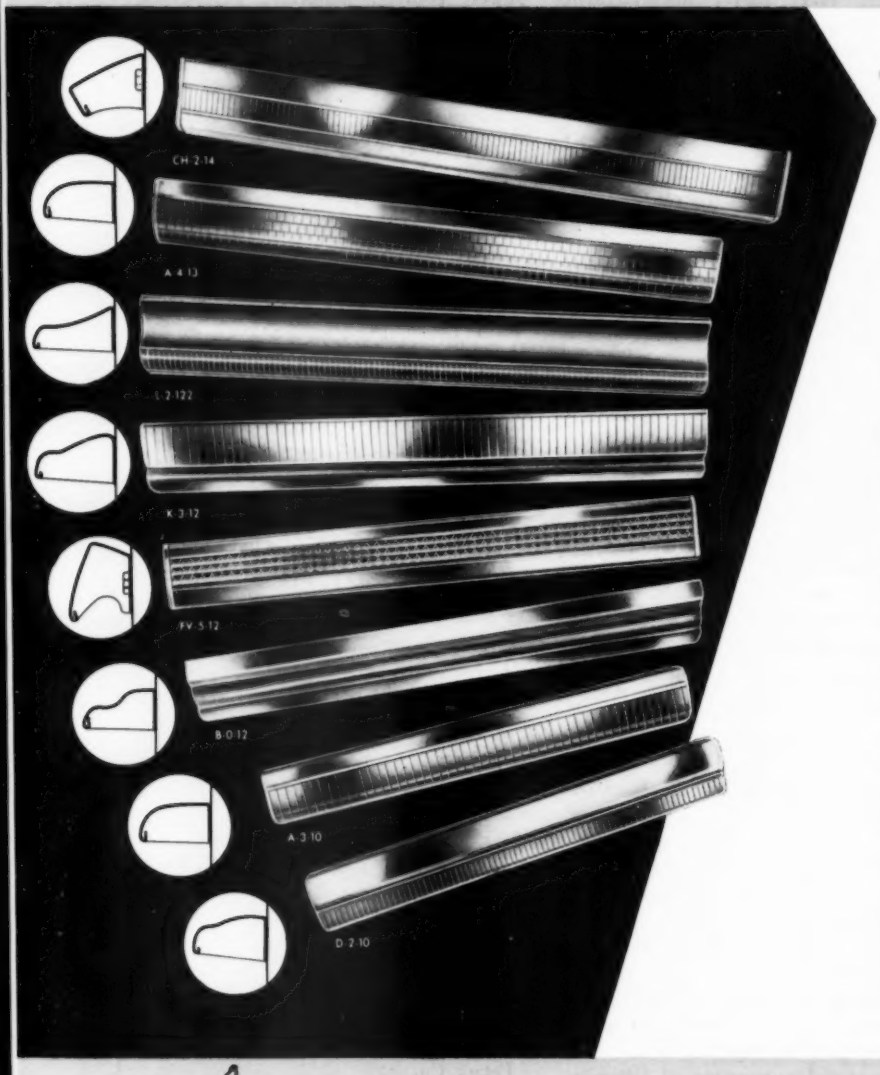
"*Engineering Audit of Design Quality*," by G. W. Schroeder, General Electric Corp.

"*Positive Quality Control*," by C. Wood, Whirlpool Corp.

"*Service — Its Scope and Limitations*," by H. L. Gross, Sears Roebuck and Co.

# PERMA-GRIP® Handles

*are available to you in . . .*



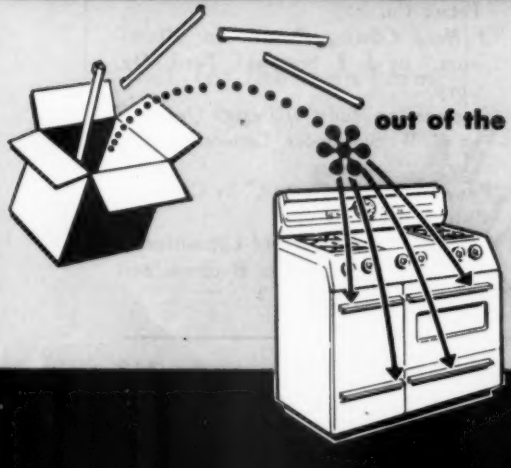

## 12 STANDARD MODELS

### IN THE MILLS LINE YOU HAVE A SELECTION OF DISTINCTIVE DESIGNS AVAILABLE IMMEDIATELY AT STANDARD PRODUCTION PRICES . . .

PERMA-GRIP® handles are produced by Mills Products, Incorporated, manufacturer of the now universally accepted PERMA-VIEW® oven door window.

You can now purchase your appliance handles built to Mills' quality standards. Twelve standard models are offered and six standard patterns are available on any model handle. All handles have plastic spacers which serve as a thermo-break. If you wish, consult with our engineering department regarding special custom requirements.

We have the skilled personnel, the specialized equipment, and we use the right materials to assure a reliable source for quality PERMA-GRIP handles. Let our specialized production lines serve as a part of your sub-assembly facilities. Phone or write us for complete details on PERMA-GRIP handles.



**out of the carton—onto your range!**



GENUINE PERMA-VIEW NON-FOG

*THE WINDOW YOU CAN SEE THROUGH ALWAYS*

# MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

## personals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LANGSETH


MAYTAG

**Robert J. Derleth** has been appointed chief engineer of **Motor Wheel Corp.** Previously, Derleth was the firm's passenger car equipment sales representative in Detroit.

**Caloric Appliance Corp.** has announced the promotion of three production executives at its Topton plant. **Joseph P. Klein** has been named to the position of plant manager; **Joseph M. Langseth** moves up to the post of production manager; and **Einar Andersen** has been promoted to superintendent of the press and tool and die departments.

**Harris H. Paxton** has been appointed appliance sales manager of **Detroit Controls,** a division of **American-Standard.** Paxton has been with the company 20 years.

**John C. Sargent** and **Kenneth J. Fenelon** have been named field sales and service engineers for the **A.B.T. Mfg. Corp.,** Rockford, Ill. They will sell and service the company's line of coin and currency handling devices in the Midwest.

**Fred Maytag II** was named chairman of the board and chief executive officer of **The Maytag Co.** at a recent board meeting. He is succeeded as president by **George M. Umbreit,** who has been executive vice president and treasurer. In other Maytag changes, **E. G. Higdon,** who has been vice president and comptroller, was elected executive vice president and treasurer. **N. C. Carlsen** succeeds him as comptroller. Also, **Eugene A. Nicol** has been promoted to general superintendent of production at the company's Plant 2 in Newton, Iowa.

**L. W. Prestin** has been appointed to the newly-created position of director of marketing at **Sunbeam Corp.** Prestin, who also becomes a vice president, had been president of the subsidiary, Sunbeam Corp., Ltd., of Canada.

**The Tappan Co.** has announced five promotions in its sales department: **Robert B. Davis,** assistant general sales manager; **David L. Shelly,** product manager in charge of electronic ranges and refrigerators; **D. Thomas Webster,** product manager of the gas range division; **David C. Rainey,** product manager of the electric range division; and **Martin V. Wolf,** manager of contract sales.

**Val J. Plouffe** has joined the sales staff of **Commercial Water Heater Co.** He was formerly commercial sales manager for Rudd Mfg. Co.

**George McArthur, Jr.,** has been appointed to the newly-created post of director of engineering of the **Sunray Stove Co.** He will be responsible for all product design and manufacturing engineering.

**James E. Wilson** has been appointed manager of special heat processing for **General Electric's Industrial Heating Dept.** He succeeds **Richard A. Schaus,** who has been named manager of fuel processing engineering for the company's Atomic Power Equipment Dept.

**Norge Div., Borg-Warner Corp.,** has announced five top management changes: **Judson S. Sayre,** president since May, 1954, becomes chairman of the board and chief executive officer; **Robert H. Quayle, Jr.,** becomes president; **Harold P. Bull** has been named vice president and assistant to the president; **Walter C. Fischer** succeeds Bull as vice president of sales; and **Spencer Rich** has been named director of commercial laundry sales.

**John B. Koch** has been named director of engineering for the Kewanee, Ill., plant of **American-Standard Industrial Div.** Prior to assuming his new post, Koch was assistant director of mechanical design.

**Gerald E. Veino** has been appointed manager of product forecasting and sales analysis for **Dole Valve Co.** He will be responsible for all product forecasting and sales analysis for the company's full line of thermostats, valves, and flow controls. Veino was formerly assistant to the director of marketing.

**Ferd W. Fisher,** formerly chief engineer of heating and air conditioning, has been promoted to chief engineer for all products of the **Heater Div. of Eaton Mfg. Co.** At the same time, **William E. Sala,** formerly chief engineer of accessories and special products, has been appointed manager of after-market products; **K. E. Chilcoat,** formerly sales representative in Detroit, has been named manager of Detroit sales; **R. L. Jackson,** formerly sales engineer in Detroit, was promoted to assistant chief engineer; and **R. G. Southey,** formerly an inspection supervisor, was named chief inspector.

**E. B. Thompson,** sales manager, has been elected a vice president of **Parker Rust Proof Co.** Thompson joined Parker in 1938.

**Landers, Frary & Clark** has announced five major appointments: **Rex Chilton Wilson,** chief research engineer; **Roland J. Fernekes,** manager of manufacturing engineering; **Leland C. Shar-**

*to Page 117* →

PAXTON

DAVIS

RICH

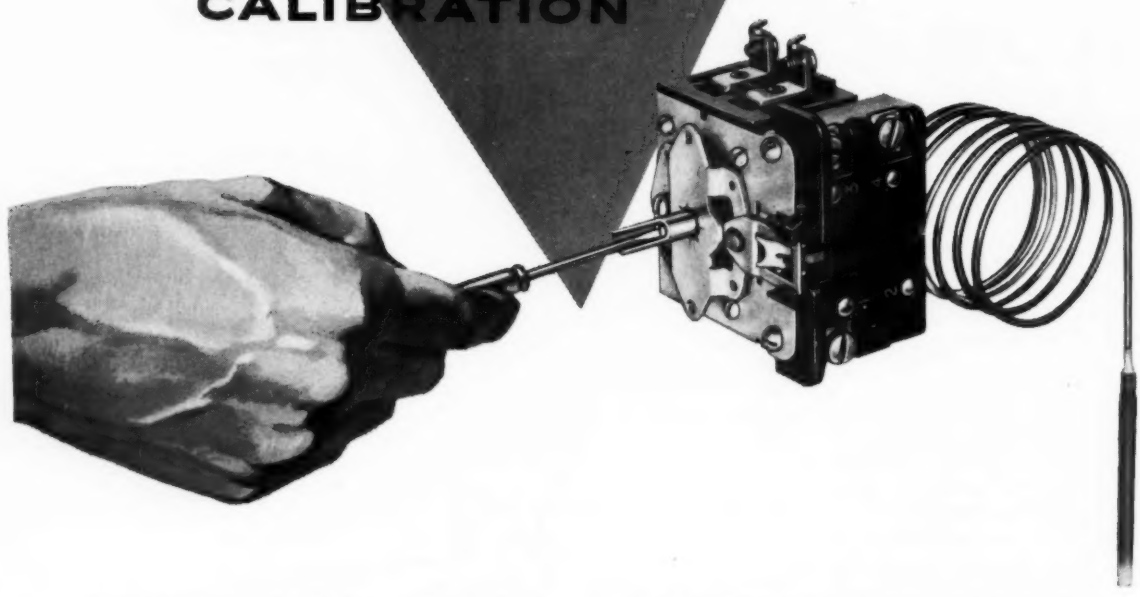
KOCH

VEINO

THOMPSON

## NEW FROM WILCOLATOR

# Simplified field CALIBRATION



Wilcolator has originated a new and simpler method of calibrating its Model G thermostats. In the event that it is ever needed, field calibration can be accomplished faster and more accurately than ever before.

All that is required is that the dial be removed and the setscrew adjusted in the hollowed center shaft. No disassembly of the thermostat is required, since adjustment is made from the front. This easier method of field calibration not only makes greater accuracy possible, but saves valuable time for all concerned.

Wilcolator G thermostats, both single and double pole, are the highest rated, most compact low-cost thermostats on the market. They are designed for every heating and cooling application and are UL listed and approved.

Write today for complete information on the Wilcolator line of G controls.

*Thermostats for Every Heating and Cooling Application*

THE Wilcolator COMPANY

THE WILCOLATOR COMPANY
1001 NEWARK AVE., ELIZABETH, N. J.
Subsidiaries and/or affiliates in
Canada, Great Britain, Italy, Western Germany, and Australia

## Personals

→ *from Page 115*

**ron,** manager of tool making and tool design; **Paul G. Garrity,** vice president of marketing; and **Walter Matthews,** indusrial and government contract sales manager.

**Leo Forth, Jr.,** superintendent of technical service at the Los Angeles plant of the **Sherwin-Williams Co.,** has been named project manager of the company's industrial sales division at the plant. In his new post, Forth will direct new products development for the industrial division, particularly as it relates to product finishing systems.

FORTH

STEWART

**Richard M. Stewart,** president of **The American Brass Co.,** has been elected to the board of directors of **MacDermid, Inc.** He was named to the board to fill the vacancy left by the retirement of **Archie MacDermid,** founder of the firm.

**Robert G. Urban** has been appointed vice president in the marketing department and assistant to the vice president, marketing, for **Philco Corp.'s** consumer products division.

**Thomas J. Behan** has been appointed manager of **Crucible Steel Co.'s** Buffalo, N. Y., sales branch. He was formerly assistant sales manager at the branch.

BEHAN

TURK

**Richard H. Turk III** has been elected a vice president of **Pemco Corp.** Works manager for the past several years, Turk now will be responsible for all manufacturing and production at Pemco. **A. J. Lubertine** replaces Turk as works manager, and **Frank E. Chapman, Jr.,** has been promoted to plant superintendent.

*to Page 121* →

## METAL PRODUCTS STATISTICS

| | | 1960 (Units) | 1959 (Units) | % Change |
|---|---|---|---|---|
| Gas Furnaces | February | 58,300 | 61,500 | - 5.2 |
| | Jan.-Feb. | 118,100 | 124,900 | - 5.4 |
| Gas Boilers | February | 8,071 | 6,350 | +27.1 |
| | Jan.-Feb. | 14,944 | 12,404 | +20.5 |
| Gas Conversion Burners | February | 7,500 | 6,100 | +23.0 |
| | Jan.-Feb. | 14,600 | 12,800 | +14.1 |
| Oil-Fired Central Heating Equipment | February | * | 35,691 | * |
| | Jan.-Feb. | * | 79,708 | * |
| Gas Ranges, Free-Standing | February | 136,400 | 133,000 | + 2.6 |
| | Jan.-Feb. | 246,500 | 262,400 | - 6.1 |
| Gas Ranges, Built-In | February | 22,600 | 19,400 | +16.5 |
| | Jan.-Feb. | 44,600 | 38,700 | +15.2 |
| Gas Water Heaters | February | 213,800 | 259,700 | -17.7 |
| | Jan.-Feb. | 429,700 | 525,900 | -18.3 |
| Gas Vented Recessed Wall Heaters | February | 25,200 | 32,900 | -23.4 |
| | Jan.-Feb. | 51,900 | 63,300 | -18.0 |
| Gas Floor Furnaces | February | 4,500 | 5,000 | -10.0 |
| | Jan.-Feb. | 8,200 | 11,000 | -25.5 |
| Gas Direct Heating Equipment | February | 47,900 | 55,600 | -13.8 |
| | Jan.-Feb. | 91,100 | 108,300 | -15.9 |
| Gas Unit Heaters & Duct Furnaces | February | 14,300 | 11,300 | +26.5 |
| | Jan.-Feb. | 27,200 | 23,400 | +16.2 |
| Gas Incinerators | February | 4,600 | 2,800 | +64.3 |
| | Jan.-Feb. | 8,000 | 5,600 | +42.9 |
| Electric Household Refrigerators | February | 302,400 | 306,200 | - 1.2 |
| | Jan.-Feb. | 569,100 | 562,400 | + 1.1 |
| Electric Farm & Home Freezers | February | 97,400 | 90,600 | + 7.5 |
| | Jan.-Feb. | 150,600 | 169,400 | -11.0 |
| Electric Ranges, Free-Standing | February | 83,500 | 86,000 | - 2.9 |
| | Jan.-Feb. | 150,900 | 165,200 | - 8.6 |
| Electric Ranges, Built-In | February | 59,700 | 48,600 | +22.8 |
| | Jan.-Feb. | 105,800 | 90,200 | +17.2 |
| Electric Water Heaters | February | 60,500 | 75,500 | -18.7 |
| | Jan.-Feb. | 109,200 | 138,200 | -20.9 |
| Electric Dishwashers | February | 46,000 | 39,500 | +16.4 |
| | Jan.-Feb. | 83,200 | 75,300 | +10.4 |
| Electric Food Waste Disposers | February | 56,300 | 59,000 | - 6.2 |
| | Jan.-Feb. | 108,100 | 107,500 | + 0.5 |
| Combination Washer-Dryer | February | 16,381 | 20,586 | -20.0 |
| | Jan.-Feb. | 30,345 | 37,508 | -19.0 |
| Washers—Automatic & Semi | February | 222,463 | 228,955 | - 3.0 |
| | Jan.-Feb. | 425,406 | 452,848 | - 6.0 |
| Washers—Wringer & All Other | February | 61,177 | 68,871 | -11.0 |
| | Jan.-Feb. | 112,799 | 133,469 | -15.0 |
| Electric Dryers | February | 69,898 | 69,422 | + 1.0 |
| | Jan.-Feb. | 144,075 | 148,015 | - 3.0 |
| Gas Dryers | February | 38,469 | 36,852 | + 4.0 |
| | Jan.-Feb. | 75,895 | 76,479 | - 1.0 |
| Vacuum Cleaners | February | 294,483 | 271,396 | + 8.5 |
| | Jan.-Feb. | 552,813 | 513,912 | + 7.6 |
| Metal Furniture | February | * | * | - 1.0 |
| | Jan.-Feb. | * | * | (4) |
| †Television | February | 503,453 | 459,492 | + 8.7 |
| | Jan.-Feb. | 1,029,947 | 896,518 | +12.9 |
| †Radio (1) | February | 1,442,368 | 1,125,385 | +21.9 |
| | Jan.-Feb. | 2,798,156 | 2,250,122 | +19.6 |
| Typewriters | February | 76,770 | | |
| | Jan.-Feb. | 145,449 | | |
| Compressor Bodies (2) | Jan.-Dec. | | 4,926,657 | +37.0 (a) |
| Steel Barrels & Drums | January | 2,568,299 | 2,597,560 | - 1.1 |
| Steel Pails | January | 5,376,852 | 5,013,101 | + 7.2 |
| Unitary Air Conditioners (3) | Jan.-Dec. | | 285,935 | |
| Heat Pumps | Jan.-Dec. | | 35,167 | |

(1) Including auto receivers (2) Except for household refrigerators
(3) Including heat pumps (4) No change (a) Increase over 1958
* Not reported † Output — all other figures are factory shipments or factory sales

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.


# MID-CONTINENT'S FASTENER PACKAGING SERVICE DOES IT ECONOMICALLY AND PACKAGES IT BETTER, FASTER!

**Here is a new concept in packaging of assembly materials. fasten-PAK electronic packaging is less expensive than any other method now employed and when your materials are purchased from Mid-Continent Screw Products Company, your savings are doubled.**

Here is what **fasten-PAK** does for you!

1. **fasten-PAK** will sort assembly materials in a multiple of sizes and assortment. It will package items in either translucent or kraft opaque bags completely enclosed. The package is printed, filled, and sealed in one operation.
2. Most assembly materials can be packaged by **fasten-PAK** process. Many of the items include: Wood Screws, Sheet Metal Screws, Machine Screws Square-Head Set Screws, Square Nuts, Hex Nuts, Cap Nuts, Wing Nuts, Round Nuts, Lag Bolts, Machine Bolts, Carriage Bolts, Washers, Cotter Pins, and Nails. We are not limited to types of metals ferrous or non-ferrous. Most sizes can be accommodated.
3. Each package may carry your own message, printed on the bag. Up to three lines of copy may be used to describe the contents and promote the quality of your product. This feature also eliminates any chance of error in packaging of proper materials.

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5842 NO. BROADWAY DEPT. MPM CHICAGO 40, ILLINOIS

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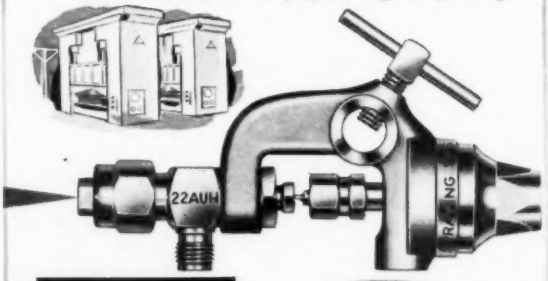


No. 22AUHSSTC
*AutoJet*

with
**TUNGSTEN CARBIDE** valve seat and needle
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**STAINLESS STEEL** body and cap
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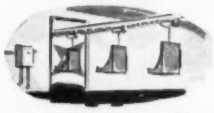
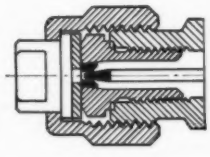
**TEFLON** packings





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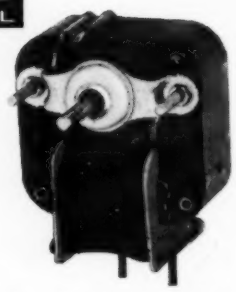

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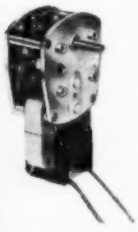
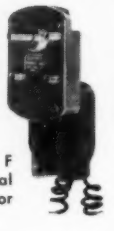


Series S
Open Spur
Gear Motors

Series W
Open Worm
Gear Motor



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NATIONAL LOCK COMPANY
Industrial Hardware Division
ROCKFORD, ILLINOIS

## Personals

→ *from Page 117*

**Norman W. Eckhardt** has been named to the new position of marketing manager of **Barnes Mfg. Co.** He was regional manager of the Kellogg Switchboard and Supply Co. before joining Barnes recently. Other new appointments at Barnes include **J. H. Hulse, Jr.,** manager of water system sales; **W. D. Schneider,** manager of pump sales; **S. J. Kelsey,** manager of contract sales; and **P. E. Finical,** manager of advertising and sales promotion.

**Marjorie Scott** has been appointed a field home economist for **Ironrite, Inc.** She will work in sales training and promotion and will assist in the educational department.

**Albert Emanuel** has been named merchandising manager of home laundry products for **Philco Corp.** He had been product manager for home laundry since 1956.

**Remington Electric Shaver Div., Sperry Rand,** has appointed three men to new posts in the division's sales organization; **Robert D. Short,** national sales manager; **William F. Mulrenan,** eastern division sales manager; and **Leonard E. Evans,** assistant national sales manager.

**Charles H. David** has joined the **Bogen-Presto Div., Siegler Corp.,** as high-fidelity products manager. He had been a sales manager for several manufacturers.

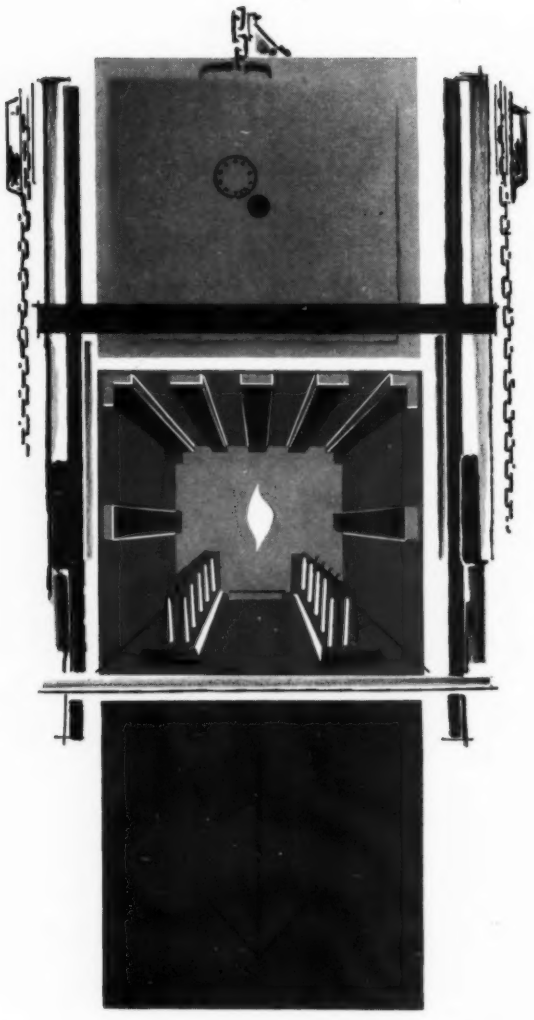
**Richard C. Connell** has been appointed vice president in charge of sales for the vacuum cleaner division of **Eureka Williams Corp.** He takes over the duties of **A. A. McCarthy,** who is heading certain factory branches and large brand-name accounts from his new headquarters in Chicago.

**Lee B. Thomas** has been elected president of **Thomas Industries, Inc.,** manufacturer of lighting fixtures. **John G. Beam,** executive vice president of the company, was elected to the board to replace Thomas.

**D. W. Knudtson** has been promoted to vice president of **Lewis Bolt & Nut Co.** He will handle all the works management of the Minneapolis plant.

**Graeme B. Supple** has been elevated to a position in charge of future planning and development for products on the air side of air conditioning product lines of the **American-Standard Industrial Div.** He will carry the title of product manager. In other personnel changes, American-Standard named **T. I Harriman**





**THE HEAT'S ON AT PEMCO.** For a full half century, Pemco has concentrated the flame of research on the problems of better porcelain enamels, glazes and glass colors. Because of this continuing search with pilot plant equipment, many of the materials and processes you use today were originally developed by Pemco. Because the heat is always on, the materials you use in the future will also be Pemco developments.

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HIGH QUALITY PORCELAIN ENAMEL FRITS AND COLORING OXIDES


ANDERSON


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KUENN


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MURRAY


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manager of pricing services, a new position, and **J. S. McCain** replaces Supple as manager of the firm's Great Lakes sales region. Also, **Sheldon D. Johnson, Jr.,** was appointed manager of quality control of the company's Columbus, Ohio, plant.

**Robert P. Norris** has been promoted to the post of comptroller of **Martin Steel Corp.** He was formerly chief accountant.

**Waste King Corp.** has promoted **Dr. Hans Jordan** to the newly-created position of vice president engineering counsel. In addition, the company has announced the appointment of **A. M. Anderson** to the new post of vice president appliance engineering.

**John E. Wilson** has been appointed to the post of manager of manufacturing of the **Marchant Div.** of **Smith-Corona Marchant Inc.,** Oakland, Calif.

**W. Whitney Kuenn** has joined the industrial sales organization of **Lux Clock Mfg. Co.** The announcement was made by Eugene T. Crandall, industrial sales manager. He will be responsible for the sales of Lux timing devices to appliance manufacturers in the central Ohio area. He has been contacting the appliance manufacturers for the past 17 years. Prior to joining Lux he was associated with Owens-Corning.

**Miss Mary Pauline (Polly) Murray** has been appointed field home economist for the **Westinghouse Home Economics Institute,** according to Miss Camille Beauchamp, director. Miss Murray has been with Westinghouse since 1954 starting as a home economist with the Westinghouse distributor in Miami. In two years she moved on to become home economist for the Mid-Atlantic region, working out of the Philadelphia headquarters.

**F. Walter Perl** has been appointed to the new position of manager of industrial design for the **Westinghouse Electric Corporation's Portable Appliance Division,** it was announced recently by Richard J. Sargent, vice president and general manager of the division.

**Beverley L. Britton** has been appointed director of public relations for the **Robertshaw-Fulton Controls Co.** Until recently, he was manager of the news bureau of the Baltimore, Md., division of The Martin Co.

**Walter Rivers** has been promoted to the position of assistant general manager in charge of sales for **Reynolds Aluminum Supply Co.** He has been general manager of sales for southern states since 1955.

**Lee W. Rasch** has been named sales manager of **Consolidated Industries Corp.** He has held engineering and sales executive positions with Security Mfg. Co. and most recently with Temco, Inc.

**Robert E. Groening** has been appointed general sales manager of **United Welder, Inc.** He has been with the company five years.

**George Matacek** has been promoted to chief chemist of the **Western Div., Bee Chemical Co.** He was formerly group leader in the company's research department.

**Frank R. Goggins,** former service manager, has been named market research manager of **White Products Corp. Vernon J. Hooper** has taken over as service manager and **Larry Dubois** has been appointed service claims manager.

**Montell P. Painter** has been appointed director of manufacturing for the **Lewyt Corp.** Painter comes to Lewyt from the General Electric Co., where he spent 27 years.

**Raymond G. Mozley** has been named to the position of vice president, overseas operations, of **Copeland Refrigeration Corp.** He has been associated with Copeland since 1952 as assistant to the vice president of engineering, chief laboratory engineer, and chief application engineer.

**W. J. Foster** has been appointed president and director of sales of the **Geo. D. Roper Corp.** Foster has been associated with Roper for over 30 years. Roper also announced the appointment of **Harry Sahlin** as controller of the firm. **David Bradly** succeeds Sahlin as comptroller.

**Constantine Keen** is the new credit manager of the **Fedders Corp.** Formerly assistant credit manager, Keen succeeds **Thomas Peck,** who was recently named general manager of the Fedders Financial Corp., a financing affiliate of Fedders.

**Edward M. Haines** has been elected to the newly-created position of vice president and assistant to the president of the **York Div., Borg-Warner Corp.** Haines formerly served with General Electric and Hotpoint.

**John S. Sneed** has been promoted to purchasing agent and **Arthur G. McIntyre** has been named production control supervisor at Waste King Corp.

**S. Martin Fassler** has been named marketing manager for the **General Electric Television Receiver Dept.** He joined GE in 1933 as a member of the advertising staff of the appliance and merchandising department.

**Harlan Von Seggern** has joined **The Maytag Co.** as safety and plant protection engineer at the firm's wringer washer plant, Newton, Iowa.

**Richard Petersen** has been appointed chief engineer in charge of research and advanced development engineering for **Utility Appliance Corp.** Petersen, who has been with Utility since 1939, will be responsible for the development of new products relating to Utility's Gaffers & Sattler product division's current line.

**Joseph Glassner** has been named manager of manufacturing for **Raytheon Co.'s** Commercial Apparatus and Systems Div. He was formerly assistant division manager of the firm's Equipment and Systems Div.

**R. W. Jones, Jr.** was recently named vice president in charge of air conditioning sales of the Air Conditioning Div., **Friedrich Refrigerators, Inc.** He formerly served as sales manager of the division.

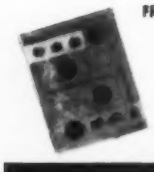

# QUALITY *above all*

"Quality refrigerators require quality shipping containers!"

GIBSON REFRIGERATOR DIVISION

HUPP CORPORATION, GREENVILLE, MICH.


**LARGE OR SMALL — CHICAGO MILL MAKES 'EM ALL!**
**A COMPLETE LINE OF CONTAINERS FOR EVERY SHIPPING PURPOSE!**



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PALLET BOXES — Wire Bound


PALLET BOXES — Hinged Corner


Cleated Boxes


E-Z Pak Cleated Corrugated (Watkins type)


Wirebound Crates


Wirebound Boxes


Corrugated


Hinged Corner Crates or Boxes

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# safe transit

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DANA CHASE PUBLICATIONS, INC.
York Street at Park Avenue
Elmhurst, Illinois

**editorial voice of the national safe transit program**

**devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.**

## Safety Latches for Larger Hoist Hooks

A recently introduced line of safety latches for converting standard hoist hooks to safety hooks has been expanded by The Harrington Co., Plymouth Meeting, Pa., to include eight new sizes for larger hoist hooks.

Announced early in 1959 in four sizes for ¼-ton through 3-ton capacity hoist hooks, the safety latches are now available from stock for heavier industrial, foundry, material handling, and similar hoist applications, in hook sizes through 10 ton. Sizes above 10 ton are made to order.

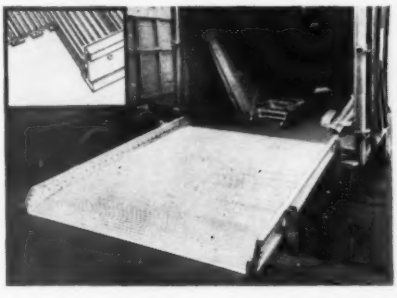
The latches are fitted on any hook in minutes with hand tools, and prevent accidental dropping and detaching of

loads. The safety device has only two major parts; a clamp-on collar and a spring-loaded safety latch which fits into the hook opening. Lugs on both sides of the latch permit operation of the device without need for putting fingers into hook openings.

## Magnesium Dockboard and Bridge

Material handling operation is said to be lightened and speeded with a new, light, magnesium dockboard developed by White Metal Rolling & Stamping Corp., 443 Fourth Ave., New York 16, N. Y. Perfected after years of research, the dockboard is fabricated of ZK60, a high strength-to-weight ratio magnesium alloy.

The dockboards are available with standard and heavy duty curbing and



flooring in 3½ to 10 ft. lengths, and 3 to 6 ft. widths. Individual sections are joined together for use as ramp, dockboard combinations. Special sizes and types in longer lengths, particularly for bridges or ramps and with greater capacities, can be manufactured to fit unusual requirements and situations.

## High Capacity Industrial Truck Battery Chargers

Three new single-circuit battery chargers for charging batteries of high ampere-hour capacity have been announced by Motor Generator Corp., Troy, Ohio.

They are rated 7½, 10, and 15 kilowatt, and each one is an integral unit, is 100-per cent automatic in operation,

and is designed to charge lead-acid or nickel-iron-alkaline industrial truck batteries.

Motor, generator, and charge controls are housed in a dead-front, monitor-top control cabinet as an integral part of the motor generator set.

## Direct-through U. S.-Mexico Truck Service Sought

Approval of operating authority for Yellow Transit Freight Lines, Inc., for direct foreign traffic between the United States and Mexico has been recommended to the Interstate Commerce Commission. Yellow Transit seeks a certificate of convenience and necessity that would authorize an operation between points in the United States and Mexico. It was pointed out that there are no through trailers presently handling general freight between points in

*to page 134*→

# "Forget it...it's stainless"

**UNILOY**
**STAINLESS STEELS**

Self-protecting stainless now serves in more homes and in more ways than ever before. It's the *one* metal families trust to last. It's the *one* metal that supplies the stamp of solid quality and extra value to best-selling brands everywhere.

Build the selling gleam of Uniloy Stainless Steel into your products. It's the uniformly high quality stainless produced to match your particular requirements. For improved formability and more lustrous finish . . . always specify Uniloy.

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STEEL CORPORATION
EXECUTIVE OFFICES: BRIDGEVILLE, PA.

**STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS**

## PMI

→ *from Page 30*

ing, he showed a series of slides dealing with types of ultrasonic cleaning equipment and various applications of the equipment.

Non-destructive testing, which encompasses methods ranging from visual inspection to ultrasonic testing, was explained by John C. Smack, assistant to general sales manager, Curtiss-Wright Corp., Princeton, Conn. He explained that the purpose of non-destructive testing is to check a part without changing the dimensions or the surface properties. Ultrasonic testing, which consists of sending sound waves through a transmitting medium, into the part, and back to the sending mechanism, is an efficient way of locating mechanical defects, Smack said. He made it plain, however, that ultrasonic testing does not point up variations in the chemical composition of the material.

### Redesign award

Two winners of the John Woodman Higgins Redesign Award for 1960 were announced at a luncheon meeting. A first-prize check of $500 went to Wilbur Carlson, superintendent of the stamping shop at the Delco Appliance Div., General Motors Corp. His redesign concerned a pole piece for electric motors, which he changed over from a bar-stock extrusion to a stacked stamping. This change in the forming method resulted in a 70 per cent saving in production cost.

The new procedure for forming the pole piece is as follows: since strip material can vary as much as 15 per cent in volume, the strip is cut off in varying lengths to get a constant volume; the material is accordion pleated and coined to get the proper groove, and a second coining operation closes the pleats tightly.

An honorable mention award was presented to Walter T. Baird, sales engineer, Toledo Pressed Steel Co., who redesigned a cast aluminum tee used for ladders and scaffolding to a folded-over stamping. The new tee is said to be stronger and less brittle than the casting. It resulted in cost savings of 25 per cent.

Other sessions of the meeting included a detailed session on press design and controls, a question and answer session on a proposed safety code for power presses (which has been approved by PMI, but not officially released), and informative talks on the use of barrel finishing and drawing compounds.

## AHLMA Technical Conference

*(continued from Page 43)*

tions that would solve the problem of annual model changes. This, he said, would be a continuing series of real improvements which would be provable and fresh and frequent enough to eliminate the need for changes based on superficial or commercial reasons. "Since we must have model changes, let's make them meaningful enough and real enough so everyone benefits — the customer, the marketer, and the maker."

Major topics covered during the morning and afternoon sessions included reliability, measurements, plastics, laundry aids, foreign competition, interpreting trends in fabrics, and designing for tomorrow's home laundry needs.

As a result of the talks on "Plastics—A Problem in Application Engineering," it was agreed that the most crying need is for better communications between the formulator, the fabricator, and the home laundry appliance engineer, starting at the early development stage of the plastic part or product.

James E. Stover, manager, product planning, consumer goods export department, International General Electric Co., said that he did not foresee foreign competition making any inroads in the sale of home laundry equipment in the United States in the near future. He did say, however, that they represented very real competition in such foreign markets as South America.

*R. H. Gabriel, engineering manager, Engineering Test, Home Laundry Dept., General Electric Co.; and James E. Stover, manager, Product Planning, Consumer Goods Export Dept., International General Electric Co.*

## Armco announces Univit enameling iron

*(continued from Page 108)*

to that of conventional enameling iron. For some parts it may be necessary to roller level just before drawing to avoid stretcher strain. This is especially true of aged material or when a hot, dry lubricant is used.

Univit can be welded by the usual methods of spot, seam, and gas welding. Gas welding with a filler rod is undesirable. Postweld pits, points, shear burr or sharp corners, or any rough surface must be removed to obtain a good surface finish.

Aluminum oxides are recommended for grinding media. Silicon carbide abrasives may cause boiling.

### Enameling practice

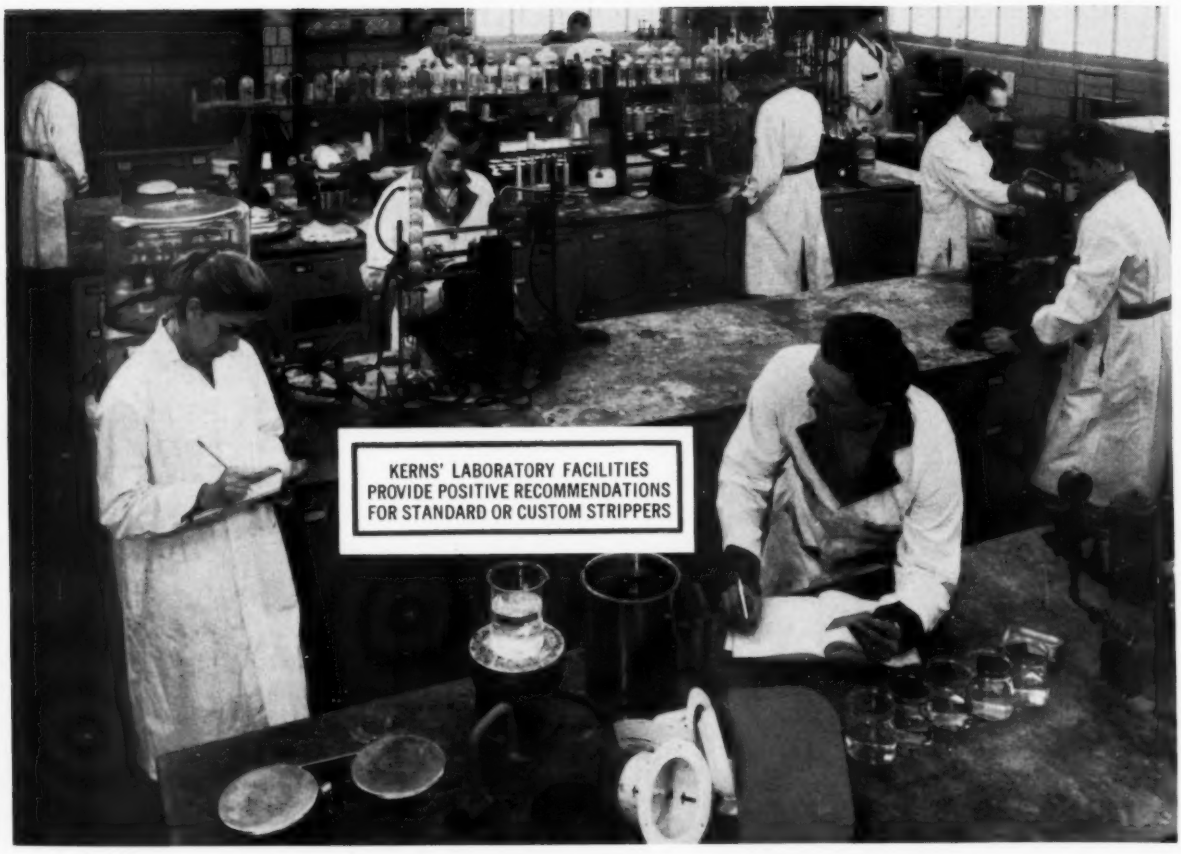
Titanium opacified frits, applied in thicknesses from 4 to 6 mils, are recommended by Armco to obtain maximum opacity and reflectance in a single coat. White and pastel colors have been applied successfully. Bright colors, particularly reds and yellows, have been less successful, although only limited work has so far been done with these colors. Chlorides in mill additions will cause blisters and copperheads, and should not be used. Deionized or distilled water is recommended in the milling of frits.

Ware may either be dipped or sprayed. Dipped ware may exhibit drain lines but will also show less orange peel.

Since the first coat is the only coat, care must be taken not to scuff or scar the dry bisque more than is permissible for any ground coat bisque.

A 20 to 30° F. higher fire is usually recommended to fire out a cover coat directly on the material, as compared to the same cover coat applied over a ground coat. This temperature increase has the effect of smoothing out the coating to minimize orange peel. If it is impracticable to fire out at a higher temperature, selection of a lower firing enamel will have the same effect.

EDITOR'S NOTE: MPM has carried many reports on materials, application techniques and plant case histories relating to the application of one coat direct-on porcelain enamels. In this connection there have been several references to Armco's Univit. Due to the period required for development and field trials, however, the first official release upon which this "short" is based was only recently issued.




# KERNS' PAINT STRIPPER RECOMMENDATIONS CAN SAVE YOU PRODUCTION TIME AND MONEY

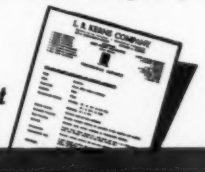
Kerns offers a complete line of low cost strippers, including hot alkaline, cold solvent and flush-off types. However, the type of paint alone does not *always* determine the most economical yet efficient stripper to be used...thickness of paint, base metal, cycling time, safety rules, method of handling, etc., are variables which should be considered.

Kerns maintains one of the finest and most modern stripper testing and research laboratories that is fully staffed with trained technicians of long experience in the industrial chemical field.

This facility is at your disposal free of charge and without obligation. For fast action, send a finished sample or panel to Kerns Technical Service Department with details of your operation. We can save you time and money by making the proper stripper recommendations.

***Memo Billing Trial Basis***

*If you would like to test a Kerns' stripper on your own production line, we will supply material . . . no formal invoice rendered unless completely approved in production!*



***for general stripper recommendations request Kerns' Stripper Selection Chart***

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## MPM

### industry meetings

**HEATING, AIR CONDITIONING**

Northamerican Heating and Air Conditioning Wholesalers, Inc.'s Spring Convention, Roosevelt Hotel, New Orleans, La., May 1-3, 1960.

**ARCHITECTURAL METAL**

The 22nd Annual Convention of the National Association of Architectural Metal Manufacturers, Boca Raton Hotel and Club, Boca Raton, Fla., May 1-7, 1960.

**CASTINGS**

1960 Castings Congress and Exposition, Convention Hall, Philadelphia, May 9-13, 1960.

**METALS SHOW**

The American Society for Metals' 2nd Southwestern Metal Congress, Sheraton-Dallas Hotel, May 9-12, and 2nd Southwestern Metal Exposition, State Fair Park, May 9-13, Dallas, Texas.

**STEEL**

Steel Service Center Institute's 51st Annual Meeting, Fontainebleau Hotel, Miami Beach, Fla., May 15-18, 1960.

**APPLIANCES**

The American Institute of Electrical Engineers' 11th Annual Appliance Technical Conference, Mansfield-Leland Hotel, Mansfield, Ohio, May 16-17, 1960.

**ELECTRONICS**

Electronic Parts Distributor's Show, Conrad Hilton Hotel, Chicago, Ill., May 16-18, 1960.

**MECHANICAL ENGINEERS**

Production Engineering Conference, sponsored by The American Society of Mechanical Engineers, Milwaukee, Wis., May 17-19, 1960.

**DESIGN ENGINEERING**

The American Society of Mechanical Engineers' Design Engineering Conference and Show, Statler-Hilton Hotel, New York City, N. Y., May 23-26, 1960.

**PORCELAIN ENAMEL**

Porcelain Enamel Institute's Midyear Conference, Hotel Biltmore, New York, N. Y., May 24-25, 1960.

**APPLIANCE MANUFACTURERS**

Institute of Appliance Manufacturers, Netherland-Hilton Hotel, Cincinnati, Ohio, June 6-10, 1960.

**REFRIGERATION**

American Society of Refrigerating Engineer's Annual Meeting, Royal York Hotel, Toronto, Ontario, Canada, June 20-22, 1960.

**KITCHEN CABINETS**

Steel Kitchen Cabinet Manufacturers' Association's Annual Meeting, Sheraton Hotel, French Lick, Ind., June 23-25, 1960.

**HOUSEWARES**

National Housewares Manufacturers' Association's 33rd National Housewares Exhibit, Convention Hall, Atlantic City, N. J., July 11-15, 1960.


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*..or that You'll want to..*

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A fabricator of metal products eliminates many production and design limitations through the use of Pre Finish Metals. Pre Finish Metals, Incorporated provides organosol, plastisol, epoxy, vinyl, acrylic or alkyd base finishes.

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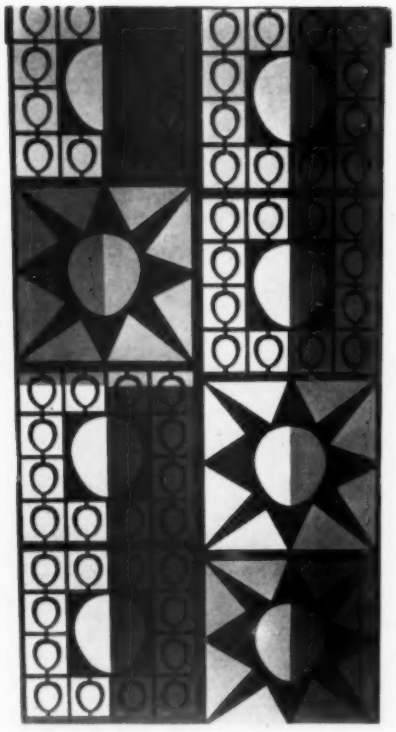


# Porcelain enamel featured at Design Center

"NEW DIMENSIONS in Porcelain Enamel," a dramatic interpretation of contemporary design possibilities for porcelain enamel, is the latest special exhibit in the Panorama at the National Design Center, New York, N. Y.

"We selected porcelain enamel for this treatment in our fifth Panorama because we feel that it is now on the threshold of a vital new era in design," said Norman E. Ginsberg, president of the National Design Center. "The time-honored properties and continuing technological developments of the material are now ready to be combined with the designer's talents in many new ways."

The exhibit will run through July 1.

In the large central exhibit area which forms the Panorama, four vignettes are on display to interpret "New Dimensions in Porcelain Enamel." A bathroom features new color ideas, while the kitchen setting presents artful designs for everyday necessities.

*(Left) — This large-scale decorative panel shows one of the new uses of porcelain enamel. It is designed to relieve monotony of a large wall.*

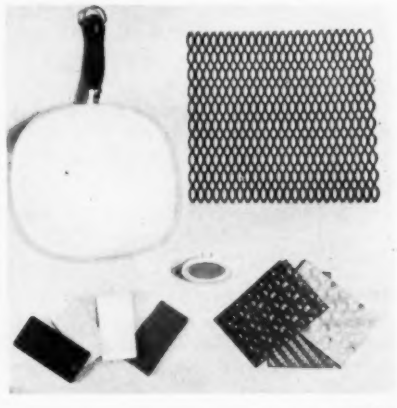
Many new decorative and artistic uses of porcelain enamel are found in the living vignette, and the fourth vignette, a patio with a swimming pool, highlights the technical as well as decorative applications of the material. The newest application of porcelain enamel, panelescent light, is demonstrated in luminous flooring in the center of the Panorama.

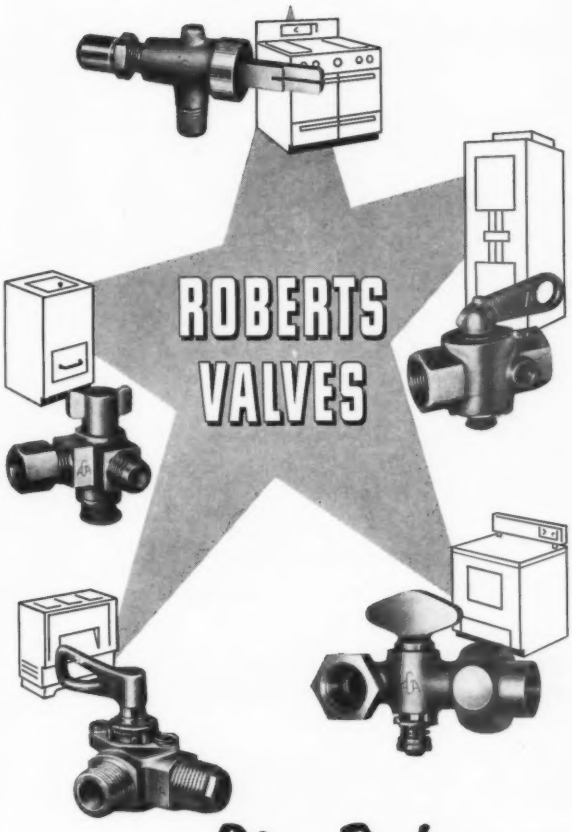
Red, white and pink striped porcelain enamel panels keynote the decor of the bath vignette. In the kitchen, patterned panels and silk-screened tiles in porcelain enamel demonstrate more of the design possibilities for the material. The hood of the "island" grill, the wall oven and dishwasher are all yellow porcelain enamel, while the clothes washer and easy-to-clean porcelain enamel work counter are charcoal.

The central section of the exhibit consists of a green porcelain enamel fountain, ringed by plants, with four orange and buff porcelain enamel grillwork panels radiating from it. The floor is made of porcelain enamel tiles covered with transluscent grey vinyl. The panelescent lighting of the floor is achieved by electrically activating the porcelain enamel after it has been combined with electroluminescent phosphors and steel.

*This bathroom setting is one of four vignettes featuring porcelain enamel. Bright, fresh coloring is carried out in the pink porcelain enamel bathtub and sink, and in the red grid panels at the windows. Echoing the porcelain enamel wall panels, a floor of vinyl strips repeats the red, white and pink stripe motif.*

*The photo below illustrates several uses of porcelain enamel: porcelain enamel on expanded metal, a panelescent plug-in night light, a skillet, and tiles.*



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**Many of the nation's leading manufacturers of gas furnaces, ranges, dryers, space heaters and countless other appliances rely on Roberts for their valves and fittings.**

**A half century of experience stands back of Roberts' fame as one of the nation's most progressive designers and manufacturers of gas valves and fittings.**

**Choose from our vast inventory of stock items or let our engineers custom design the valves and fittings you need. The quality is excellent, the price is right, the service is unsurpassed.**

**Modern gas appliances merit the finest components . . . and when it comes to valves and fittings Roberts' are superb.**

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**BRASS MFG. CO.**
P. O. BOX 307 — MITCHELL, IND.

# Mass Produce These Parts On Your Production Line

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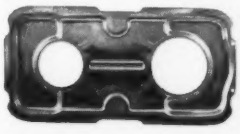
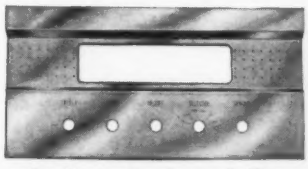
Attractive hardware items in unlimited variety are being manufactured more economically and faster from APOLLO Pre-Finished Brass and Bronze. Available pre-polished and pre-enameled, or pre-finished with bright or satin chrome – the uniform beauty of these parts cannot be equalled by costly piece finishing.



Aerator pans, oven and rotisserie linings, back rail trim, stove doors and tops and broiler pans can be mass produced at less cost when made from APOLLO satin or bright finished tarnish-resistant ChromSteel.

There's nothing as effective as gleaming APOLLO Pre-Finished ChromSteel to simplify production of all types of food service equipment. Sturdy, tarnish-resistant, easy to work, weldable, APOLLO ChromSteel permits a finer job at a fraction of the cost of piece finishing, while greatly increasing production.



APOLLO Satin-Finished BrasSteel is ideal for radio, Hi-Fi and TV cabinet trim, control panels and hardware. Pre-finished surface allows embossing, patterning and silk-screening operations to be performed before forming...cuts costs...saves time.

Deep draws, such as in this oven door, are no problem when fabricated from Specification Plate on APOLLO ChromSteel. Severe stretching will not draw out the characteristic finish or lessen the corrosion resistance of satin finishes.

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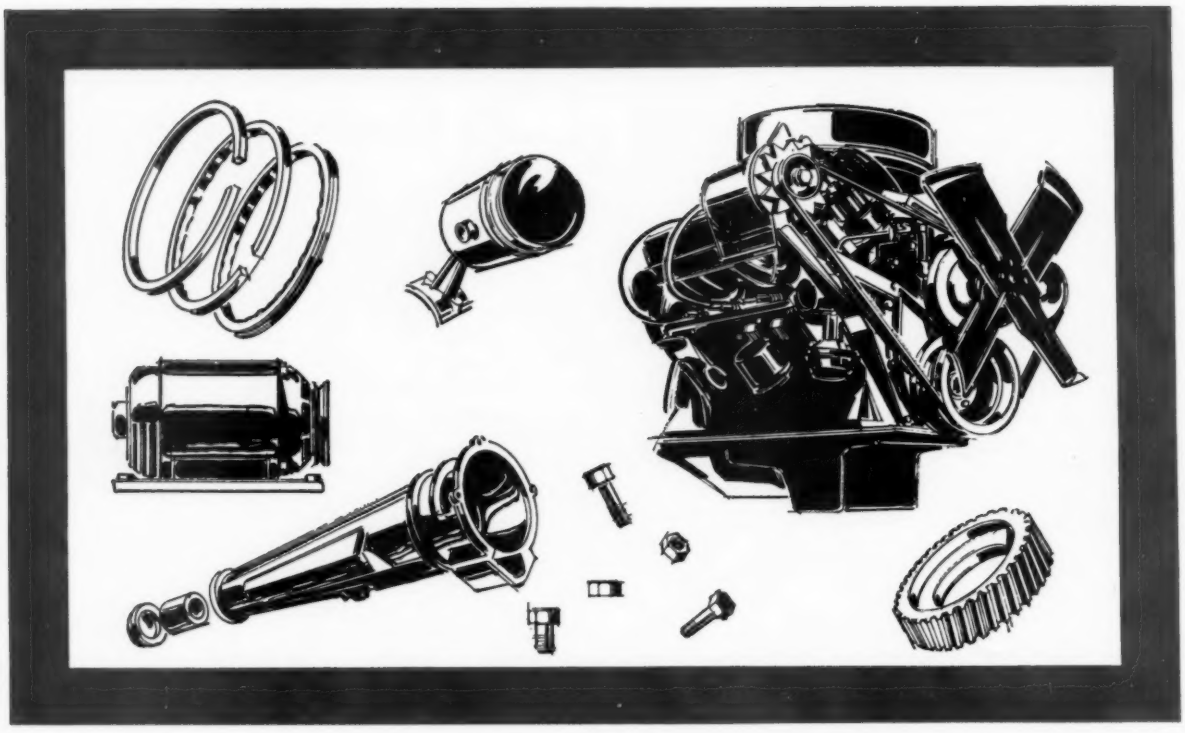

# Sprayed hot or cold, EXPRAY-AP rustproofs all machined metals

Here's a product for spray cleaning and rustproofing that's excellent for use on steel, cast iron, and other metals – in *both hot and cold washers!* Wyandotte's versatile EXPRAY-AP®!

Specially designed for use on engine parts, steering gears, refrigerator compressors, transmission parts – any highly machined surface – EXPRAY-AP removes fabricating oils, chips, and dust deposited during machining and grinding. Gives dependable rust protection between operations – even in single-stage washers! Ends your need for additional rust preventatives. Will neither etch nor corrode zinc die castings; even protects them against staining in storage. Retaining high detergent action at any temperature, EXPRAY-AP also works well with brass, copper, and bronze.

And EXPRAY-AP

- Conditions water to prevent scale formation in washers. Lowers maintenance costs.
- Rinses freely; drains and dries quickly without streaks, spots, or residues.
- Gives off no obnoxious fumes!

For profitable information on how EXPRAY-AP can help you, call in your Wyandotte representative – today. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Also Los Nietos, California; and Atlanta, Georgia. Offices in principal cities.*

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*The Best in Chemical Products for Metal Finishing*

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WATER COOLER MANUFACTURING AT EBCO

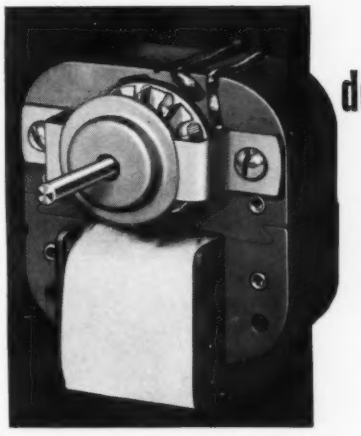
### NEWS

MONTHLY STATISTICAL REVIEW

STAFF EDITORIAL AND PHOTO COVERAGE OF ALL IMPORTANT INDUSTRY MEETINGS

★★★★★★★★★


# ALLIANCE MOTORS



dependable power... sensible cost

**MODEL JS**—a versatile, efficient, miniature power plant for business machines, vending machines and many control, switch and signal applications. Supplied from stock or customized to your specifications.

**TYPICAL JS SPECIFICATIONS**

| Full Load RPM | Torque oz./in. | Watts | Amps | Weight |
|---|---|---|---|---|
| 2900 | 2.70 | 29 | 0.57 | 1 lb. 2 oz. |


**MODEL JSG**

An extremely quiet gear train motor used in TV tuners, remote controls, rotisseries and other appliances. Mounting, operating temperature, clutch or solenoid action, torque, RPM and many other characteristics can be varied in this Alliance motor designed to meet your individual application.

**TYPICAL JSG SPECIFICATIONS**

| Output RPM | Torque oz./in. | Watts | Amps | Full Load H.P. | Weight |
|---|---|---|---|---|---|
| 12-14½ | 165 | 25.5 | 0.49 | .002 | 1 lb. 7 oz. |

*Write for complete catalog and price quotations*

WORLD'S LARGEST PRODUCERS OF SUB-FRACTIONAL HP MOTORS FOR MOST USES INCLUDING STEREOPHONIC AND HI-FI EQUIPMENT

**THE ALLIANCE MANUFACTURING CO.**

(Division of Consolidated Electronics Industries Corp.) ALLIANCE, OHIO

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**PROJECT ENGINEER**

A long-established Midwest manufacturer of home appliances has need for a development engineer with several years experience in the design of home laundry appliances to assist in devising improvements, cost reducing changes, and new features. Send resumé and salary requirements to **Box 5A, Dana Chase Publications, Inc., York St. at Park Ave., Elmhurst, Ill.**

## Safe Transit news

→ *from Page 125*

the two countries. Through traffic at the Laredo gateway is presently transferred from linehaul trucks at Laredo or Nuevo Laredo to local cartage trucks. The Yellow Transit proposal asserts that, by eliminating the necessity of unloading from linehaul trucks to local cartage trucks this side of the border, and reloading on the Mexican side, freight movement will be expedited between points in the two countries, and that transit time can be cut by several days.

Yellow Transit operates terminals in Texas, Oklahoma, Missouri, Illinois, Indiana, Kentucky, Michigan, and Ohio.

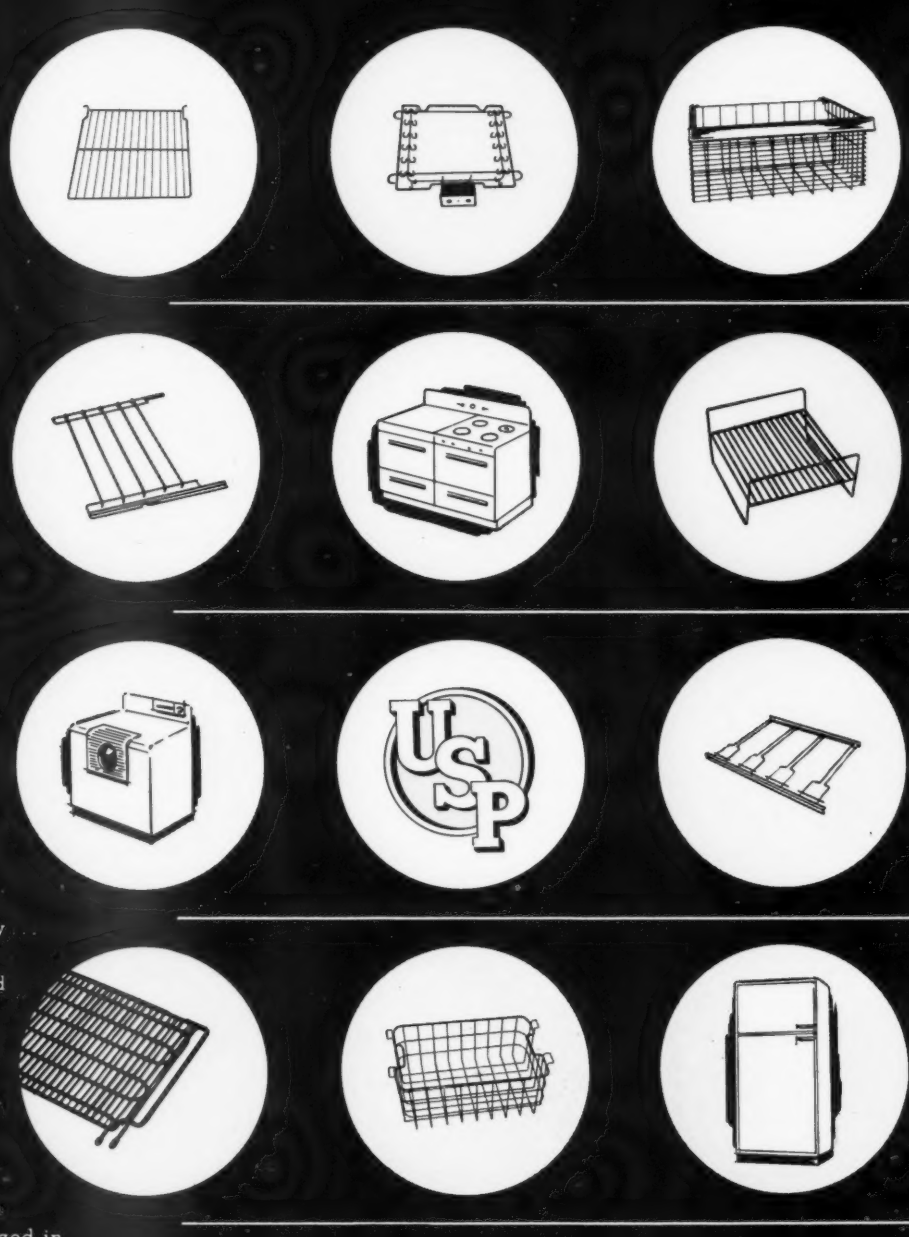
## PMI Session Includes Plant Tours and Production Methods

Plant tours through the Sequence Tool & Die Co., and Chas. Zapf & Co. were highlights of a meeting of the Pressed Metal Institute, held Tuesday, April 12 in Chicago. Personnel from member and non-member companies were able to see equipment and methods used in the manufacture of die building through use of the Elox Electrical Discharge Method.

The evening session was held at the Graemere Hotel, where a color film presentation and question-and-answer period gave members an insight into the new technological approach in die construction.

Harold Daschner, managing director of PMI, spoke briefly on the forthcoming PMI trip to Europe.

• *for those who seek the ultimate in*
WELDED WIRE COMPONENTS



Wire is a vital and functional "part of the product" in every modern appliance. Because of its styling, engineering and manufacturing versatility, its inherent strength and resilience, its lasting beauty and dependability . . . quality wire is the preferred material. That's why wire . . . welded in the desired shape and size, plated in the finish required, is basically essential to the appeal, the sale and the continued satisfaction of your appliance.

And, if you are among those who seek the ultimate in quality wire components, simply select the one manufacturer who has specialized in producing welded wire products for nearly 60 years. Specify Union Steel, the one source that guarantees the absolute ultimate in quality.

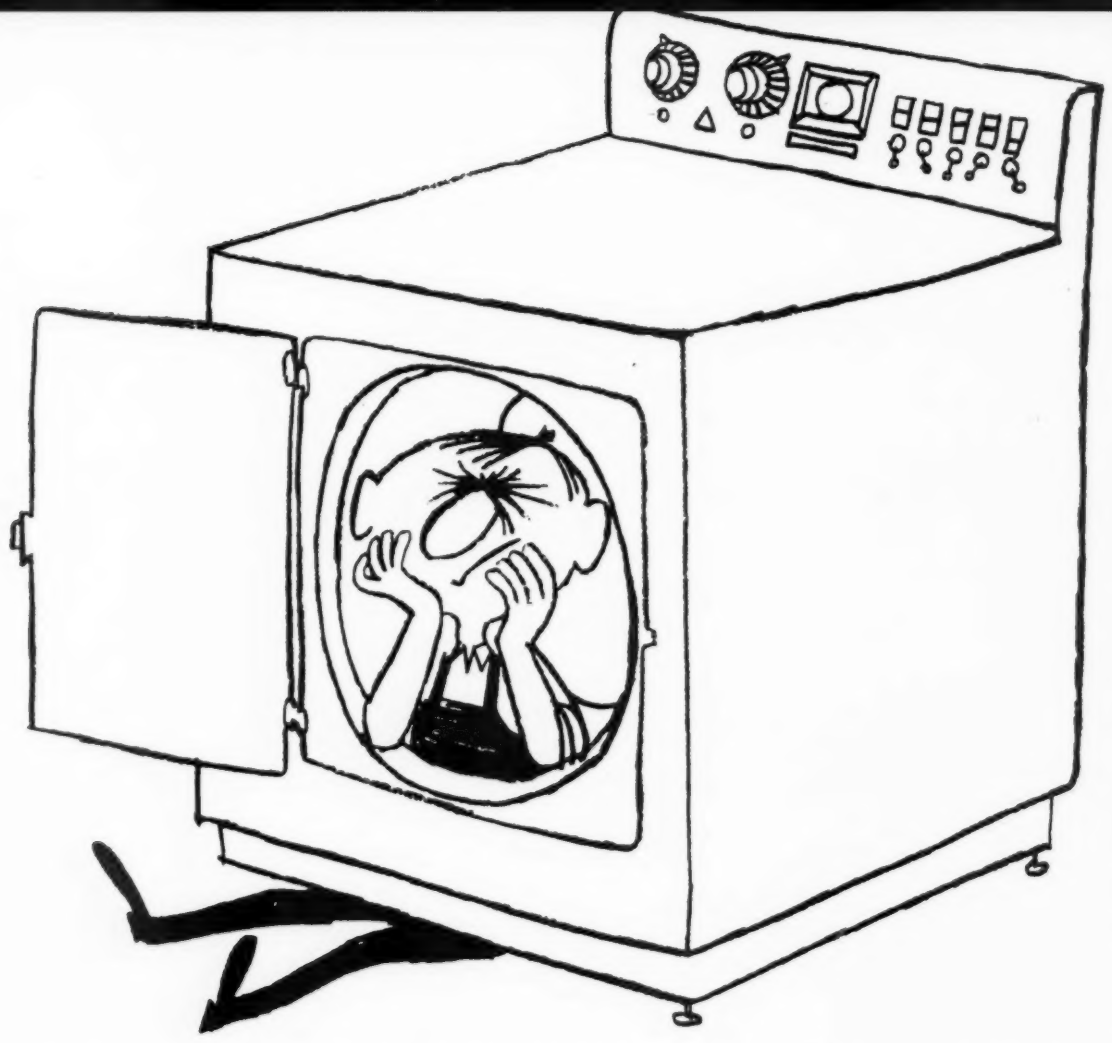
*You are most cordially invited to investigate the advantages of Union Steel's wire product design and development service, without obligation. A phone call, wire, card or letter will bring immediate service.*

FIRST NAME IN WELDED WIRE PRODUCTS

## UNION STEEL PRODUCTS CO.

*contract wire division*

ALBION, MICHIGAN



*There's only one SURE way to correct a service problem . . .*

# USE GENUINE FACTORY REPLACEMENT PARTS

Every service call is another opportunity to create good will on the part of a homeowner with a problem. Don't risk the loss of a customer or the cost of expensive call-backs by using substitute parts. Play it safe and *always* replace with Genuine Factory Replacement Parts. Only with "original equipment" parts can you be certain of getting a perfect fit and the full operating performance specified by the manufacturer.

A good example of this is the valve diaphragm (illustrated right) that DOLE supplies to appliance manufacturers. Through the years a large research group at DOLE has constantly developed and improved this part so that it would conform precisely to all manufacturers' current specs. Many non-genuine diaphragms look exactly like the Dole model but soon swell or crack in use. Without this close co-operation with the appliance manufacturer, and the thorough research and development necessary, non-genuine parts cannot be expected to meet performance requirements.

So don't take chances on parts that only look the same—your authorized name brand distributor can supply the real thing . . . genuine factory replacement parts!

They look alike, but there is a world of difference in performance. One of these valve diaphragms is a genuine DOLE Factory replacement part. The other is a non-genuine part . . . the difference is apparent only after they are installed.

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*Control with*

**DOLE**

***Appliance Controls Sales Department***

**THE DOLE VALVE COMPANY**

**6201 Oakton St., Morton Grove, Illinois**

**The Dole Valve Co. of Canada, Ltd.**

**1490 Speers Road, Oakville, Ontario**